ORDER NO. KMF0201535C2

Service Manual

Compact Plain Paper FAX

KX-FP151E-B / KX-FP151GR-W / KX-FP151SP-W

(for U.K.)
(for Greece)
(for Spain)
(for Portugal)

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

When you note the serial number,write down all 11 digits. The serial number may be found on the bottom of the unit.

1. TRANSLATION LIST

1.1. LCD MESSAGES

SPANISH

ENGLISH	SPANISH															
CALL SERVICE	L	L	A	M	E		S	E	R	V	I	C	I	O		
CALL SERVICE2	L	L	A	M	E		S	E	R	V	I	C	I	O		2
CALLER ID	I	D		L	L	A	M	A	D	A						
CHECK DOCUMENT			R	E	V	I	S	A	R		D	O	C	.		
CHECK FILM	R	E	V	.		P	E	L	I	C	U	L	A			
CHECK MEMORY	R	E	V	I	S	A	R		M	E	M	O	R	I	A	
CHECK PAPER	R	E	V	I	S	A	R		P	A	P	E	L			
COPIER	C	O	P	I	A	D	O	R	A							
COVER OPEN	T	A	P	A		A	B	I	E	R	T	A				
DIRECTORY	D	I	R	E	C	T	O	R	I	O						
DIRECTORY FULL	D	I	R	E	C	T	O	R	I	O		L	L	E	N	O
FAX IN MEMORY	F	A	X		E	N		M	E	M	O	R	I	A		
FAX MEMORY FULL	M	E	M	.		F	A	X		L	L	E	N	A		
FAX RECEIVING	R	E	C	E	P		F	A	X							
FEATURE LIST	L	I	S	T	A			F	U	N	C	I	O	N	E	S
MEMORY FULL		M	E	M	O	R	I	A		L	L	E	N	A		
MODEM ERROR	E	R	R	O	R		E	N		M	O	D	E	M		
NO FAX REPLY	S	I	N		R	E	S	P		F	A	X				
PAPER JAMMED	P	A	P	E	L		A	T	A	S	C	A	D	O		
PLEASE WAIT	P	O	R		F	A	V	O	R		E	S	P	E	R	E
POLLING ERROR	E	R	R	O	R		D	E		P	O	L	L	I	N	G
PRESS NAVI [<>]	P	U	L	S	E		N	A	V	I	.	[	<<		>>	]
PRESS SET							P	U	L	S	E		S	E	T	
PRINTING			I	M	P	R	I	M	I	E	N	D	O			
QUICK SET UP	R	A	P	I	D	A		P	R	O	G					
REDIAL TIME OUT	R	E	L	L	.		C	A	N	C	E	L	A	D	A	
REMOVE DOCUMENT	S	A	Q	U	E		D	O	C	U	M	E	N	T	O	
REPORTS	R	E	P	O	R	T	E	S								
SETUP ITEM [ ]	N	o	.	P	R	O	G	.		[	@		]			
SYSTEM SET UP	P	R	O	G	.		S	I	S	T	E	M	A			
TRANSMIT ERROR	E	R	R	O	R		D	E		T	R	A	N	S	.	
UNIT OVERHEATED	S	O	B	R	E	C	A	L	E	N	T	A	D	O		
USER STOPPED	A	L	T	O		X		U	S	U	A	R	I	O		
YOUR FAX NO.	S	U		N	U	M	E	R	O		D	E		F	A	X
YOUR LOGO	S	U		L	O	G	O									

PORTUGUESE

ENGLISH	PORTUGUESE															
CALL SERVICE	C	H	A	M	E		T	É	C	N	I	C	O			
CALL SERVICE2	C	H	A	M	E		T	É	C	N	I	C	O	2		
CALLER ID	I	D		E	M	I	S	S	O	R						
CHECK DOCUMENT	V	E	R	I	F	I	Q	U	E		D	O	C	.		
CHECK FILM	V	E	R	I	F	I	Q	U	E		F	I	L	M	E	
CHECK MEMORY	V	E	R	I	F	I	Q	U	E		M	E	M	O	.	
CHECK PAPER	V	E	R	I	F	I	Q	U	E		P	A	P	E	L	
COPIER	C	O	P	I	A	D	O	R								
COVER OPEN	T	A	M	P	A		A	B	E	R	T	A				
DIRECTORY	D	I	R	E	C	T	O	R	I	O						
DIRECTORY FULL	D	I	R	E	C	T	O	R	I	O		C	H	E	I	O
FAX IN MEMORY	D	O	C	.	N	A		M	E	M	Ó	R	I	A		
FAX MEMORY FULL	M	E	M	O	.	F	A	X		C	H	E	I	A		
FAX RECEIVING	R	E	C	E	B	E	R		F	A	X					
FEATURE LIST	L	I	S	T	A		F	U	N	Ç	Õ	E	S			
MEMORY FULL	M	E	M	Ó	R	I	A		C	H	E	I	A			
MODEM ERROR	E	R	R	O		M	O	D	E	M						
NO FAX REPLY	S	E	M		R	E	S	P	O	S	T	A				
PAPER JAMMED	P	A	P	E	L		E	N	C	R	A	V	A	D	O	
PLEASE WAIT	A	G	U	A	R	D	E		P	.	F	A	V	O	R	
POLLING ERROR	E	R	R	O		P	U	X	A	R						
PRESS NAVI.[<>]	P	R	I	M	A		N	A	V	I	.	[	<<		>>	]
PRESS SET							P	R	I	M	A		S	E	T	
PRINTING		A		I	M	P	R	I	M	I	R					
QUICK SET UP	P	R	O	G	.	R	Á	P	I	D	A					
REDIAL TIME OUT	F	I	M		R	E	P	E	T	I	Ç	Ã	O			
REMOVE DOCUMENT	R	E	T	I	R	E		D	O	C	.					
REPORTS	R	E	L	A	T	Ó	R	I	O	S						
SETUP ITEM [ ]	P	R	O	G	.		I	T	E	M		[	@		]	
SYSTEM SET UP	P	R	O	G	R	A	M	A	Ç	Ã	O					
TRANSMIT ERROR	E	R	R	O		T	R	A	N	S	M	.				
UNIT OVERHEATED	S	O	B	R	E	A	Q	U	E	C	I	D	A			
USER STOPPED		I	N	T	E	R	R	O	M	P	I	D	O			
YOUR FAX NO.	F	A	X		N	º										
YOUR LOGO	L	O	G	O	T	I	P	O								

1.2. ERROR CODE TABLE

SPANISH

ENGLISH	SPANISH
COMMUNICATION ERROR	ERROR DE COMUNICACION
DOCUMENT JAMMED	DOCUMENTO ATASCADO
ERROR-NOT YOUR UNIT	ERROR-NO EN SU EQUIPO
NO DOCUMENT	SIN DOCUMENTO
OK	ACEPTAR
OTHER FAX NOT RESPOND	EL OTRO FAX NO RESPONDE
PRESSED THE STOP KEY	PULSO LA TECLA STOP
RCV	RECEP
SND	ENVIO

PORTUGUESE

ENGLISH	PORTUGUESE
COMMUNICATION ERROR	ERRO DE COMUNICAÇÃO
DOCUMENT JAMMED	DOCUMENTO ENCRAVADO
ERROR-NOT YOUR UNIT	ERRO DO OUTRO EQUIPAMENTO
NO DOCUMENT	SEM DOCUMENTO
OK	OK
OTHER FAX NOT RESPOND	NÃO ATENDE
PRESSED THE STOP KEY	PRIMA A TECLA STOP
RCV	RCB.
SND	ENV.

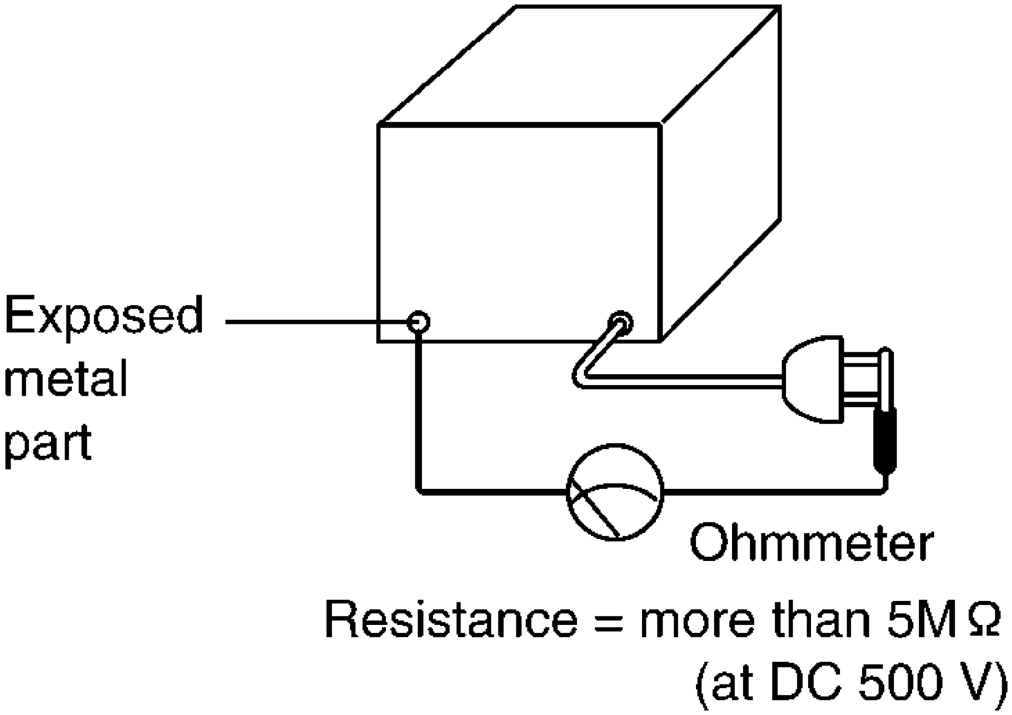
2. INTRODUCTION

2.1. SAFETY PRECAUTIONS

1. **Before servicing, unplug the AC power cord to prevent an electric shock.**
2. **When replacing parts, use only the manufacturer's recommended components.**
3. **Check the condition of the power cord. Replace if wear or damage is evident.**
4. **After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.**
5. **Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.**

2.2. INSULATION RESISTANCE TEST

1. **Unplug the power cord and short the two prongs of the plug with a jumper wire.**
2. **Turn on the power switch.**
3. **Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part (screw heads, control shafts, bottom frame, etc.).**
   Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
4. **If the measurement is outside the specified limits, there is a possibility of a shock hazard.**



2.3. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.

1. **Cover the plastic part's boxes with aluminum foil.**
2. **Ground the soldering irons.**
3. **Use a conductive mat on the worktable.**
4. **Do not touch the IC or LSI pins with bare fingers.**

2.4. BATTERY CAUTION

CAUTION

Danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to following caution :

Disposal of lithium batteries should be performed by permitted, professional disposal firms knowledgeable in state government federal and local hazardous materials and hazardous waste transportation and disposal requirements.

A battery continues to have no transportation limitations as long as it is separated to prevent short circuits and packed in strong packaging.

Commercial firms that dispose of any quantity of lithium cells should have a mechanism in place to account for their ultimate disposition. This is a good practice for all types of commercial or industrial waste.

Recommend Type Number

- PFSU1004Z (BAT501) Manufactured by TOSHIBA
- CR2032 (BAT501) Manufactured by MATSUSHITA
- PQPCR2032H09 (BAT501) Manufactured by SONY

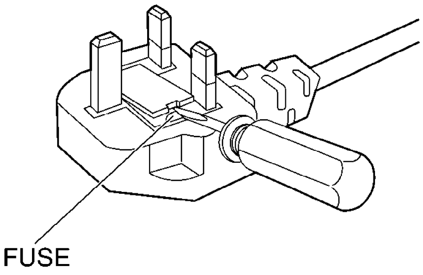
2.5. FITTING A PLUG TO THE MAINS LEAD (KX-FP151E only)

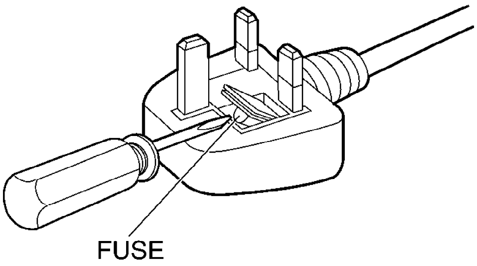
This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5 amp fuse is fitted in this plug. Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362.

Check for ASTA mark or the BSI mark on the body of the fuse.
If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic dialer.
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DAGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.
If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.
WARNING:THIS APPLIANCE MUST BE EARTHED.

IMPORTANT:
The wires in this mains lead are coloured in accordance with the following code:
Green-and-Yellow: Earth
Blue: Neutral
Brown: Live

As the colours of the wire in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚ or coloured GREEN or GREEN-AND -YELLOW.
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which s coloured BROWN must be connected to the terminal in the plug which is marked with letter L or coloured RED.
How to replace the fuse:Open the fuse compartment with a screwdriver and replace the fuse (and fuse cover).

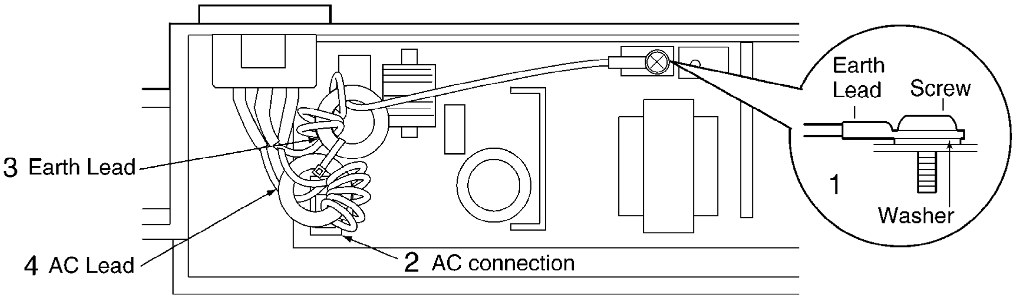




2.6. AC CAUTION

For safety, before closing the lower cabinet, please make sure of the following precautions.

1. **The earth lead is fixed with the screw.**
2. **The AC connector is connected properly.**
3. **Wrap the earth lead around the core 3 times.**
4. **Wrap the AC lead around the core 3 times.**

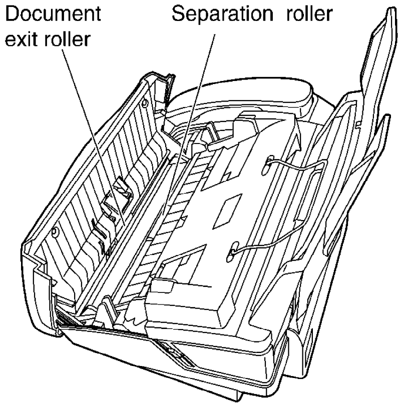


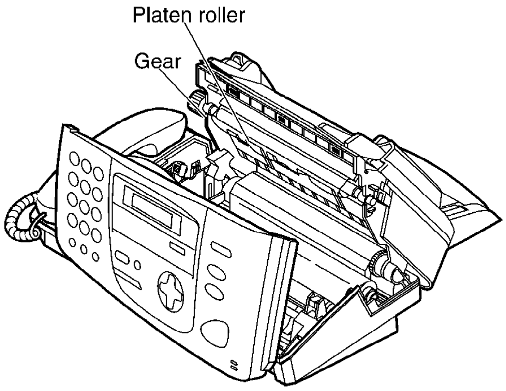
(Bottom View)

2.7. PERSONAL SAFETY PRECAUTIONS

2.7.1. MOVING SECTIONS OF THE UNIT

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving sections of the unit.
The moving sections of the unit are the rollers and a gear. There is a separation roller and a document feed roller which are rotated by the document feed motor. A gear rotates the two rollers. Be careful not to touch them with your hands, especially when the unit is operating.



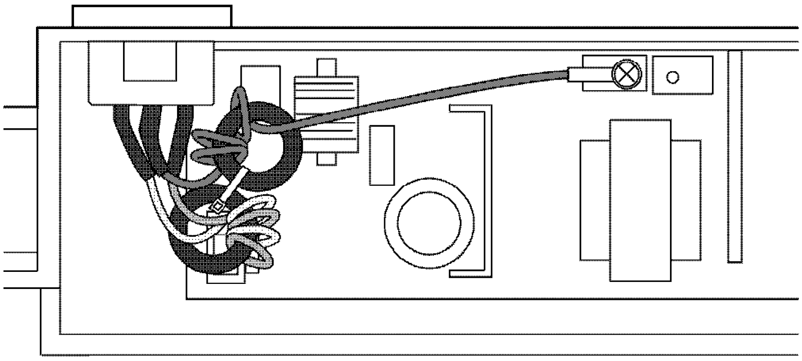


2.7.2. LIVE ELECTRICAL SECTIONS

All the electrical sections of the unit supplied with AC power by the AC power cord are live.
Never disassemble the unit for service with the AC power supply plugged in.

CAUTION:

AC voltage is supplied to the primary side of the power supply unit. Therefore, always unplug the AC power cord before disassembling for service.

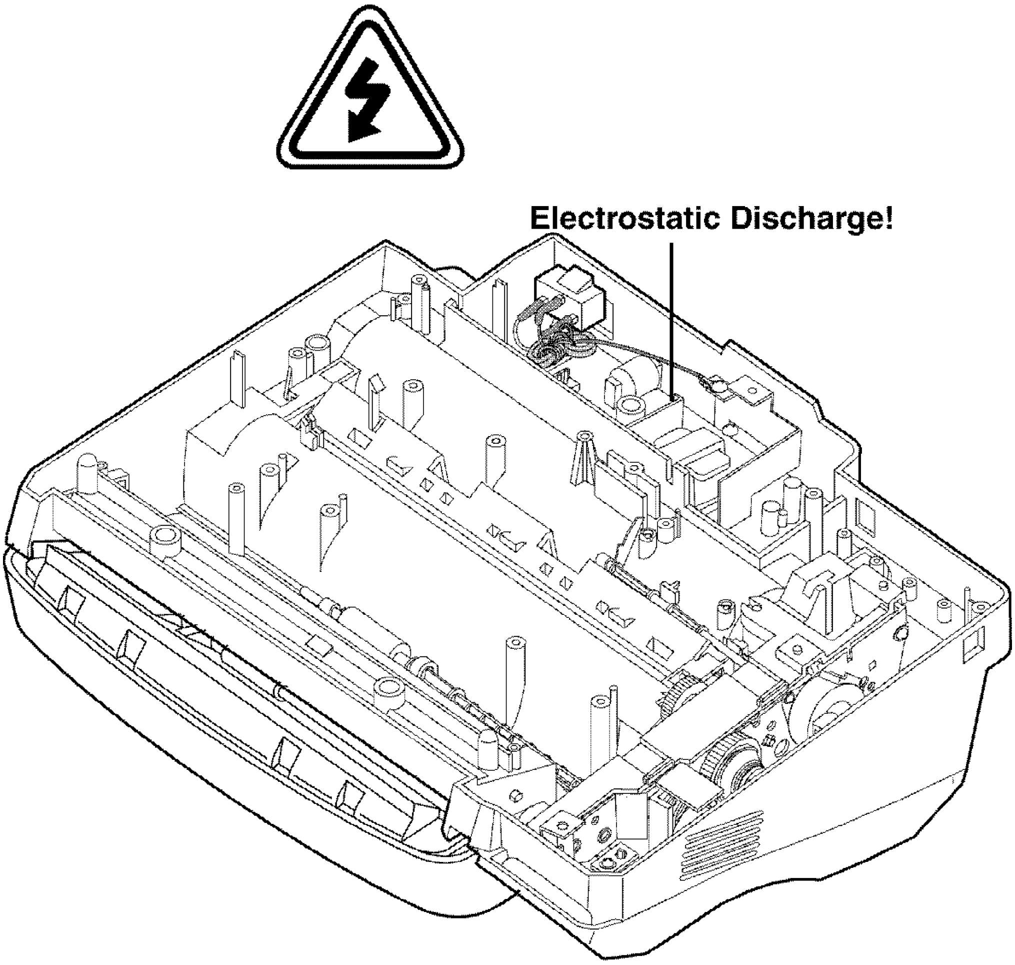


(Bottom View)

2.8. SERVICE PRECAUTIONS

2.8.1. PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

Electrical charges accumulate on a person. For instance, clothes rubbing together can damage electric elements or change their electrical characteristics. In order to prevent static electricity, touch a metallic part that is grounded to release the static electricity. Never touch the electrical sections such as the power supply unit, etc.



2.9. FEATURES

General

- Help function

Please refer to WHEN YOU DON'T KNOW HOW TO OPERATE THE UNIT, USE THE HELP FUNCTION.() to print below features.

Display: LCD MESSAGES.()

1. QUICK SET UP
2. FEATURE LIST
3. DIRECTORY
4. FAX RECEIVING
5. COPIER
6. REPORTS

7. CALLER ID

- LCD (Liquid Crystal Display) readout
- TAM (Telephone answering machine) interface

Plain Paper Facsimile Machine

- 12 second transmission speed *
- A4, G3 compatible
- Automatic document feeder (10 sheets)
- Fax pager call
- Quick scan
- Resolution: Standard/Fine/Super fine/Photo (64 level)
- Broad cast with NAVIGATOR
- 50-sheet paper capacity (20 lb.)
- Automatic fax/phone switching

*** The 12 second speed is based upon the ITU-T No. 1 Test Chart on the condition that memory transmission is performed.**

Large Memory (28 pages)... Performed by DRAM
Approx. 28 pages of memory reception
Approx. 25 pages of memory transmission

Integrated Telephone System

- On-hook dialing
- Monitor
- Voice muting
- Redialing function
- 100-Station telephone directory with NAVIGATOR
- Caller ID compatible***

*****Feature requires a subscription to caller identification services offered by certain local telephone companies for a tee. You and your caller(s) must be in areas that provide caller identification services, and compatible equipment must be used by both telephone companies. Feature not available when the unit is connected to a PBX system.**
The Caller ID service is currently not available in Portugal, January 2002.

Enhanced Copier Function

- Multi-copy function (up to 50 copies)
- Enlargement and reduction

- **Collate**
- **64-Level halftone**

2.10. SPECIFICATIONS

Applicable Lines:

Public Switched Telephone Network

Document Size:

Max. 216 mm in width
Max. 600 mm in length

Effective Scanning Width:

208 mm

Recording Paper Size:

A4: 210×297 mm
[Refer to INSTALLING THE RECORDING PAPER ()]

Effective Printing Width:

202 mm

Transmission Time*:

Approx. 12 s/page (Original mode)**

Scanning Density:

Horizontal:
8 pels/mm (203 pels/inch)
Vertical:
3.85 lines/mm (98 lines/inch)—STANDARD mode
7.7 lines/mm (196 lines/inch)—FINE / PHOTO mode
15.4 lines/mm (392 lines/inch)—SUPER FINE Mode

Halftone Level:

64-level

Scanner Type:

Contact Image Sensor (CIS)

Printer Type:

Thermal Transfer on Plain Paper

Data Compression System:

Modified Huffman (MH), Modified READ (MR), Modified Modified

READ (MMR)

Modem Speed:

9,600/7,200/4,800/2,400 bps; Automatic Fallback

Operating Environment:

5—35°C, 20—80 % RH (Relative Humidity)

Dimensions (H×W×D):

185×345×269 mm

Mass (Weight):

Approx. 3.1 kg

Power Consumption:

Standby: Approx. 5 W
Transmission: Approx. 20 W
Reception: Approx. 40 W (When receiving a 20% black document)
Copy: Approx. 40 W (When copying a 20% black document)
Maximum: Approx. 120 W (When copying a 100% black document)

Power Supply:

220-240 V AC, 50 Hz

Memory Capacity:

Fax memory:
Approx. 28 pages memory reception
Approx. 25 pages memory transmission
(Based on ITU-T No. 1 Test Chart in standard resolution without using the Error Correction Mode.)

*** Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party’s machine.**

**** The 12 second speed is based upon the ITU-T No. 1 Test Chart and original mode. [Refer to ITU-T No.1 TEST CHART().] If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.**

Note:

- Any details given in these instructions are subject to change without notice.

- The pictures and illustrations in these instructions may vary slightly from the actual product.

Design and specifications are subject to change without notice.

2.11. OPTIONAL ACCESSORIES

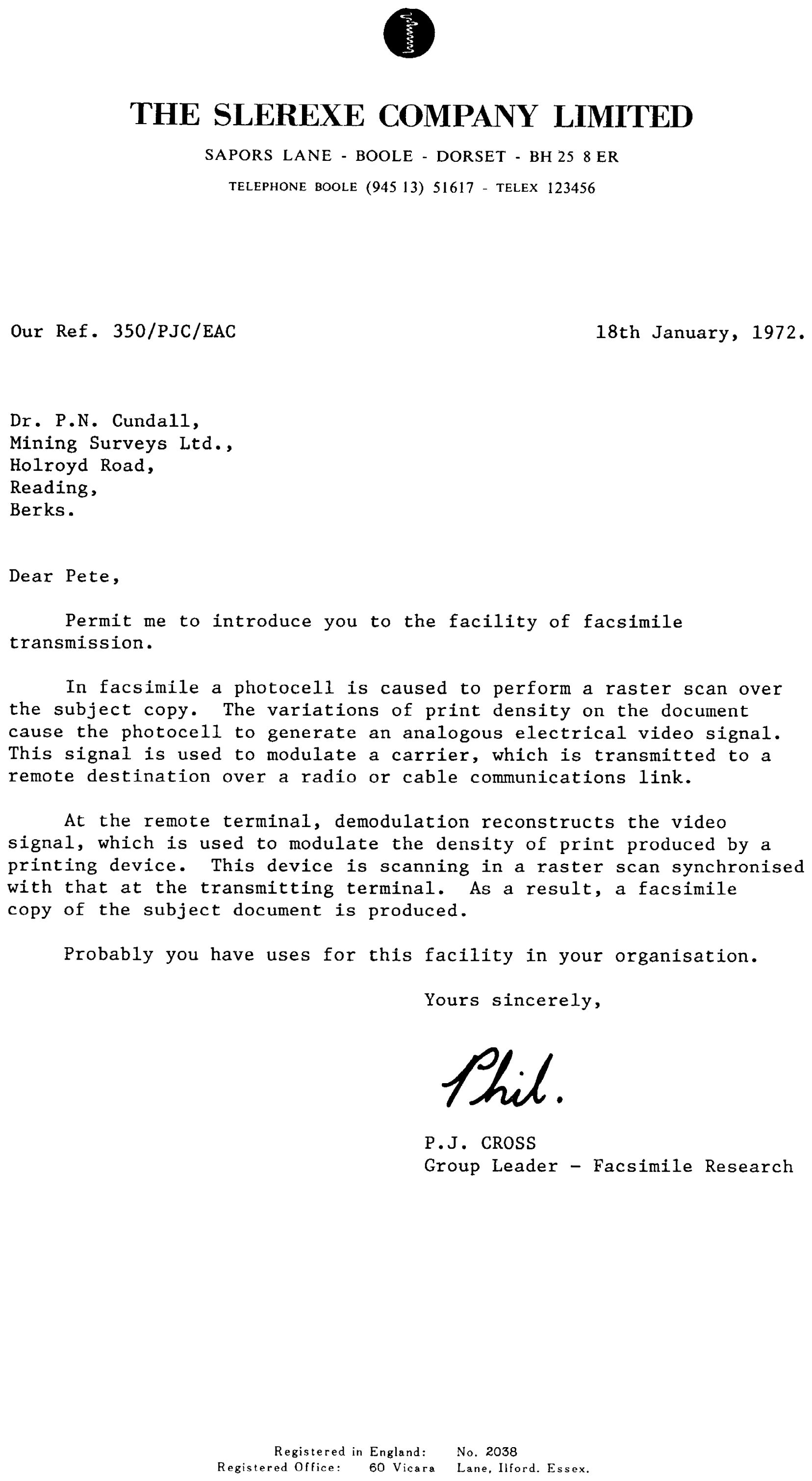
- For best results, use genuine Panasonic replacement film Model No. KX-FA55X.

Model No.	Item	Specifications / Usage
KX-FA55X	Replacement Film	2 rolls-216 mm × 50 m

Note:
The ink film is not reusable. Do not rewind and use the ink film again.

2.12. TEST CHART

2.12.1. ITU-T No.1 TEST CHART



THE SLEREXE COMPANY LIMITED
SAPORS LANE - BOOLE - DORSET - BH 25 8 ER
TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC 18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

Probably you have uses for this facility in your organisation.

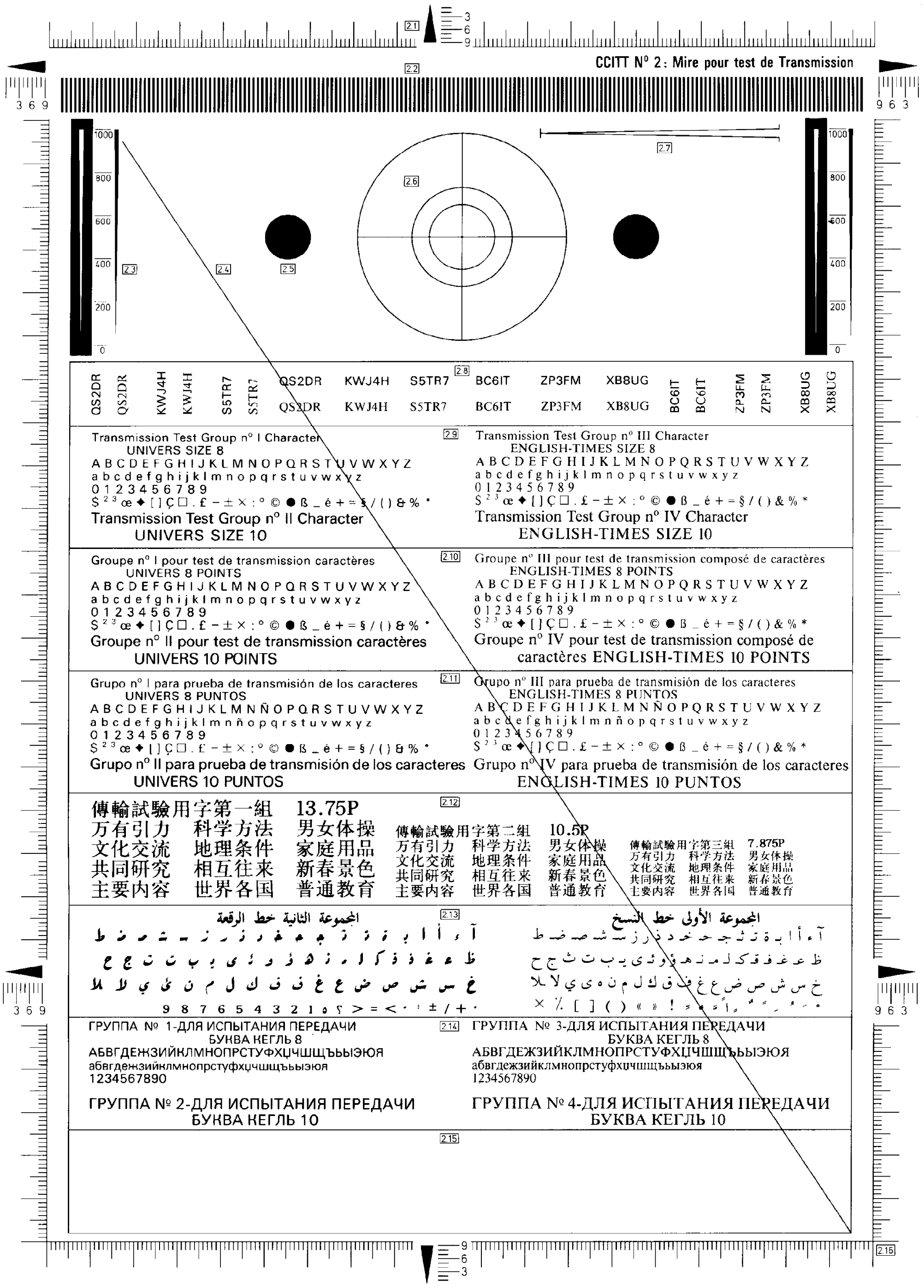
Yours sincerely,

Phil.

P.J. CROSS
Group Leader - Facsimile Research

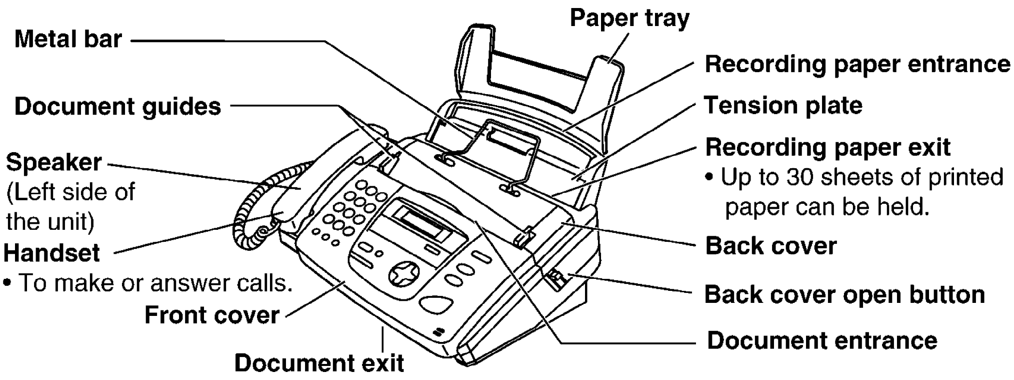
Registered in England: No. 2038
Registered Office: 60 Vicara Lane, Ilford. Essex.

2.12.2. ITU-T No.2 TEST CHART


CCITT N° 2: Mire pour test de Transmission
Transmission Test Group n° I Character UNIVERS SIZE 8
Transmission Test Group n° II Character UNIVERS SIZE 10
Transmission Test Group n° III Character ENGLISH-TIMES SIZE 8
Transmission Test Group n° IV Character ENGLISH-TIMES SIZE 10
Groupe n° I pour test de transmission caractères UNIVERS 8 POINTS
Groupe n° II pour test de transmission caractères UNIVERS 10 POINTS
Groupe n° III pour test de transmission composé de caractères ENGLISH-TIMES 8 POINTS
Groupe n° IV pour test de transmission composé de caractères ENGLISH-TIMES 10 POINTS
Grupo n° I para prueba de transmisión de los caracteres UNIVERS 8 PUNTOS
Grupo n° II para prueba de transmisión de los caracteres UNIVERS 10 PUNTOS
Grupo n° III para prueba de transmisión de los caracteres ENGLISH-TIMES 8 PUNTOS
Grupo n° IV para prueba de transmisión de los caracteres ENGLISH-TIMES 10 PUNTOS
ГРУППА № 1-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 8
ГРУППА № 2-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 10
ГРУППА № 3-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 8
ГРУППА № 4-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ БУКВА КЕГЛЬ 10

2.13. LOCATION OF CONTROLS

2.13.1. OVERVIEW


Metal bar
Document guides
Speaker
(Left side of the unit)
Handset
• To make or answer calls.
Front cover
Document exit
Paper tray
Recording paper entrance
Tension plate
Recording paper exit
• Up to 30 sheets of printed paper can be held.
Back cover
Back cover open button
Document entrance

Note:

- The document will be ejected from the front of the unit. Install the unit on a desk or floor with a smooth surface and do not place anything in front of the unit.

2.13.2. CONTROL PANEL

2.13.2.1. KX-FP151E

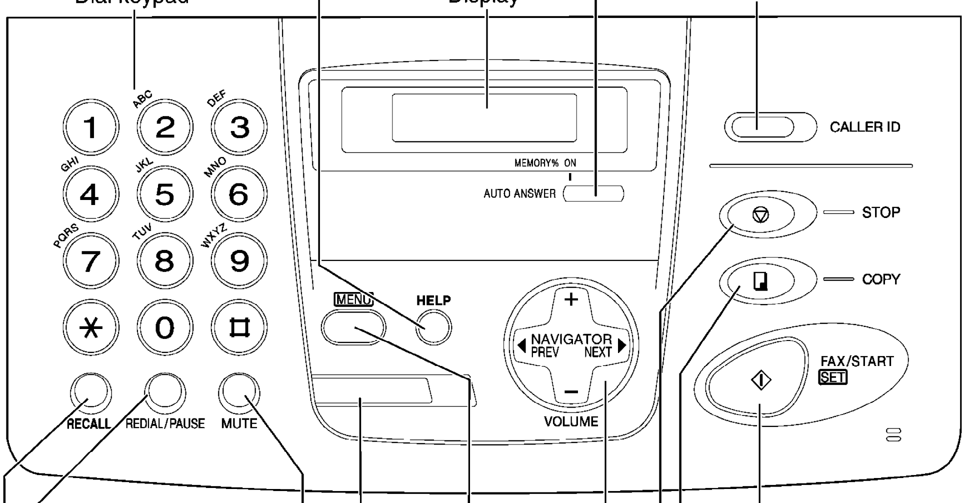
•To turn on/off AUTO ANSWER.

•To print a quick reference.

•To use caller ID service.

Dial keypad

Display


1
ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PQRS 7
TUV 8
WXYZ 9
*
0
#
RECALL
REDIAL/PAUSE
MUTE
MEMORY% ON
AUTO ANSWER
MENU
HELP
NAVIGATOR
PREV
NEXT
+
−
VOLUME
CALLER ID
STOP
COPY
FAX/START
SET

•To mute your voice to the other party during conversation. Press this button again to resume conversation.

•To initiate or exit programming.

•To initiate fax transmission or reception.

•To store a setting during programming.

•To dial without lifting the handset.

•To initiate copying.

•To redial the last number dialed.

•To insert a pause during dialing.*

•To stop an operation or cancel programming.

•To access special telephone services such as call waiting or transferring an extension call.

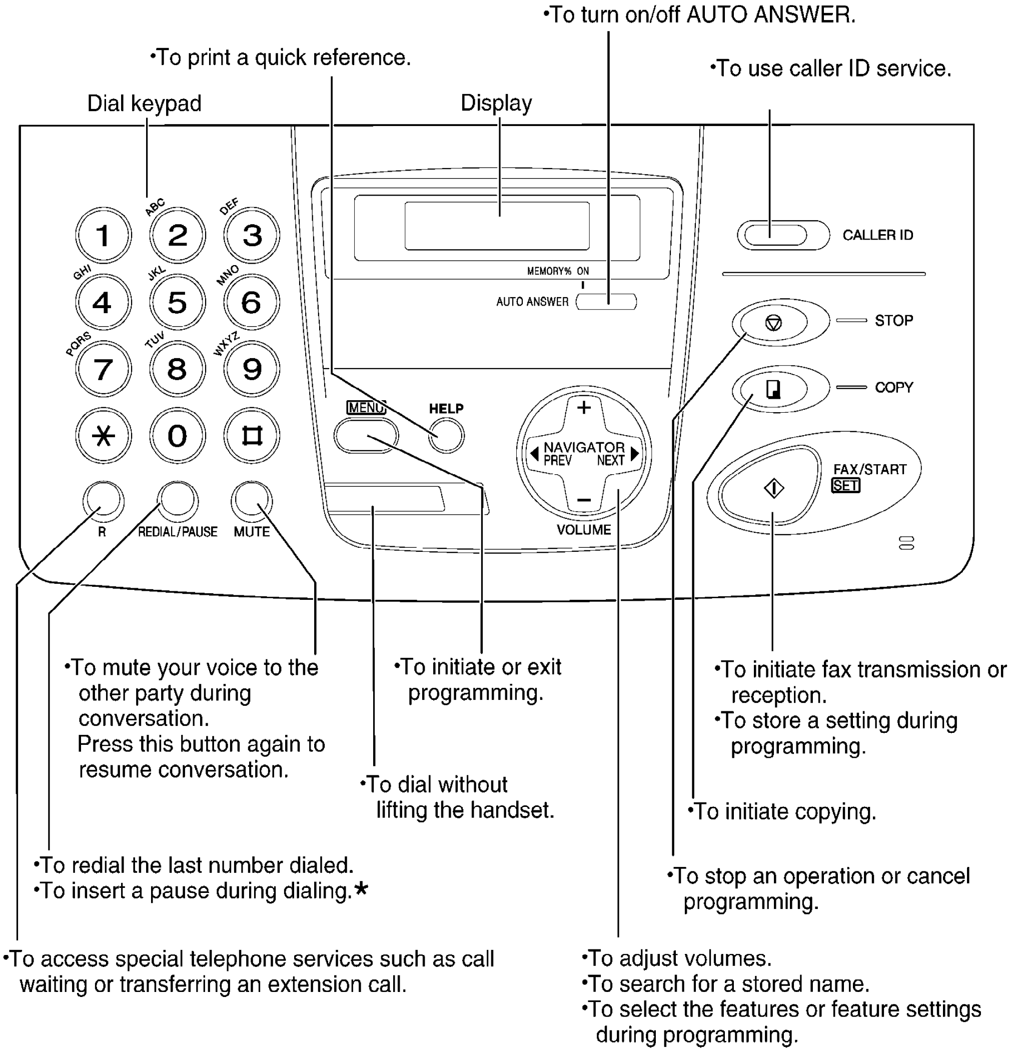
•To adjust volumes.

•To search for a stored name.

•To select the features or feature settings during programming.

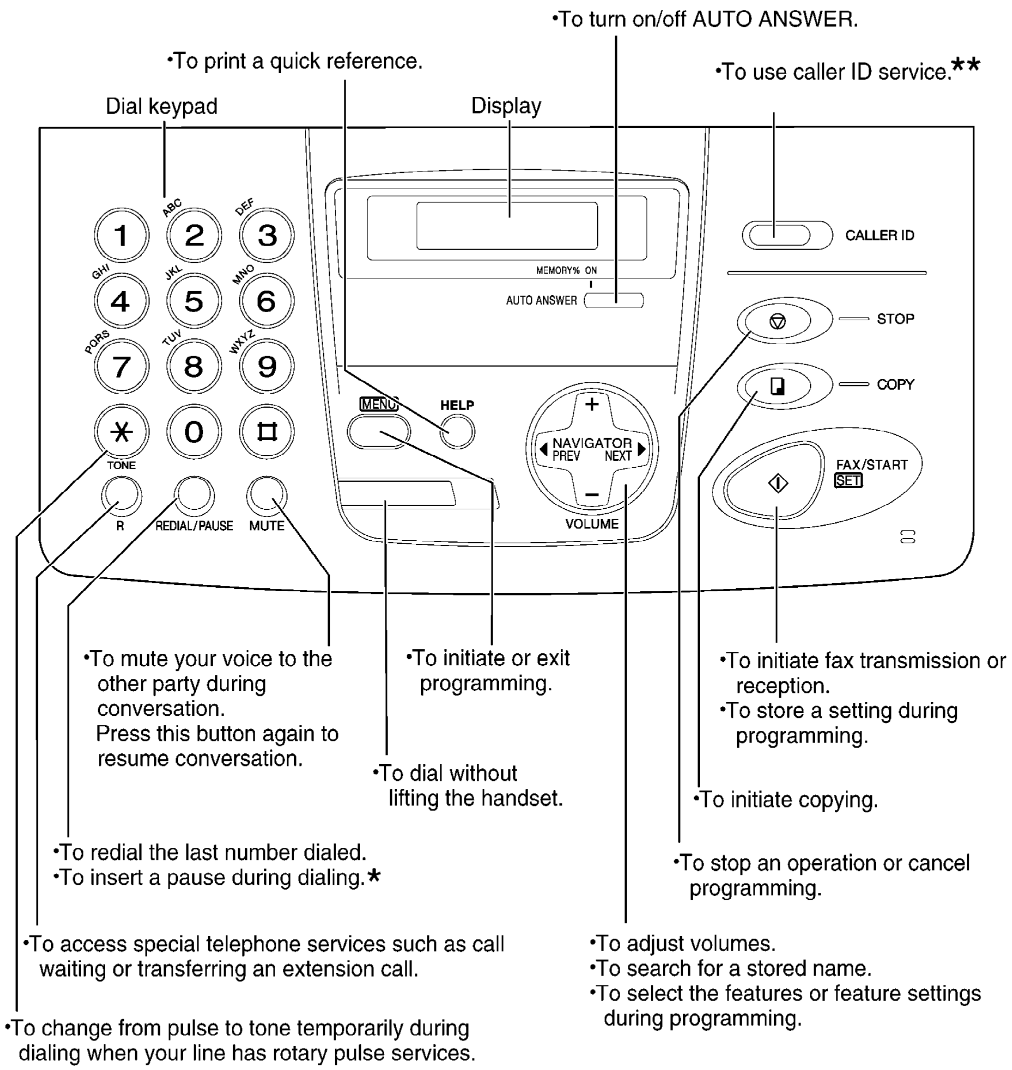
*** If the line is busy when you make a phone call using the MONITOR button, the unit will automatically redial the number up to 5 times.**

2.13.2.2. KX-FP151GR


•To turn on/off AUTO ANSWER.
•To print a quick reference.
•To use caller ID service.
Dial keypad
Display
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
0
MEMORY% ON
AUTO ANSWER
CALLER ID
STOP
COPY
MENU
HELP
NAVIGATOR
PREV
NEXT
+
−
VOLUME
FAX/START
SET
R
REDIAL/PAUSE
MUTE
•To mute your voice to the other party during conversation. Press this button again to resume conversation.
•To initiate or exit programming.
•To initiate fax transmission or reception.
•To store a setting during programming.
•To dial without lifting the handset.
•To initiate copying.
•To redial the last number dialed.
•To insert a pause during dialing.*
•To stop an operation or cancel programming.
•To access special telephone services such as call waiting or transferring an extension call.
•To adjust volumes.
•To search for a stored name.
•To select the features or feature settings during programming.

*** If the line is busy when you make a phone call using the MONITOR button, the unit will automatically redial the number up to 5 times.**

2.13.2.3. KX-FP151SP


Dial keypad
Display
1
ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PQRS 7
TUV 8
WXYZ 9
TONE
0
R
REDIAL/PAUSE
MUTE
MEMORY% ON
AUTO ANSWER
MENU
HELP
NAVIGATOR
PREV
NEXT
+
–
VOLUME
CALLER ID
STOP
COPY
FAX/START
SET

•To turn on/off AUTO ANSWER.

•To print a quick reference.

•To use caller ID service.**

•To mute your voice to the other party during conversation. Press this button again to resume conversation.

•To initiate or exit programming.

•To initiate fax transmission or reception.
•To store a setting during programming.

•To dial without lifting the handset.

•To initiate copying.

•To redial the last number dialed.
•To insert a pause during dialing.*

•To stop an operation or cancel programming.

•To access special telephone services such as call waiting or transferring an extension call.

•To adjust volumes.
•To search for a stored name.
•To select the features or feature settings during programming.

•To change from pulse to tone temporarily during dialing when your line has rotary pulse services.

*** If the line is busy when you make a phone call using the MONITOR button, the unit will automatically redial the number up to 5 times.**

**** The Caller ID service is currently not available in Portugal, January 2002.**

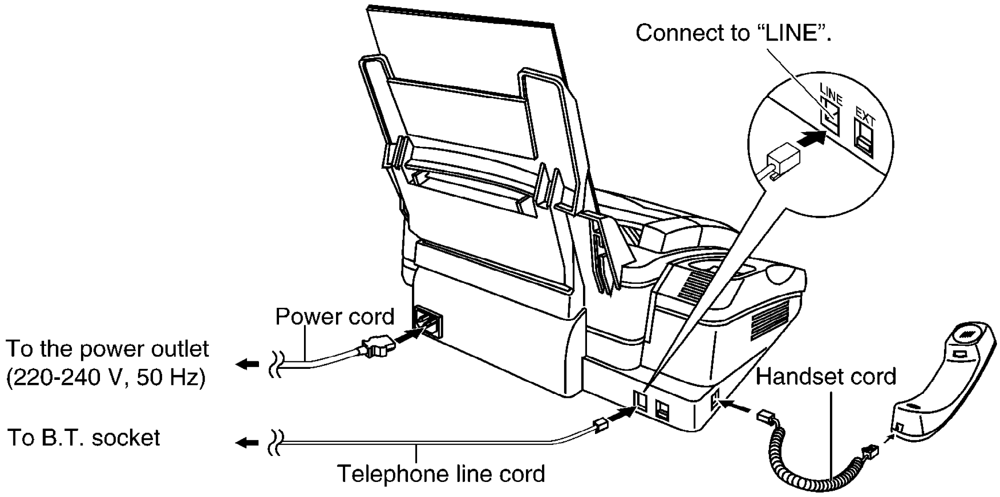
2.14. CONNECTIONS

2.14.1. KX-FP151E

(1) Connect the handset cord.

(2) Connect the telephone line cord.

(3) Connect the power cord.


Connect to "LINE".
LINE
EXT
Power cord
To the power outlet
(220-240 V, 50 Hz)
Handset cord
To B.T. socket
Telephone line cord

Caution:

- **When you operate this product, the power outlet should be near the product and easily accessible.**
- **Be sure to use the telephone line cord included in this unit.**
- **Do not extend the telephone line cord.**

Note:

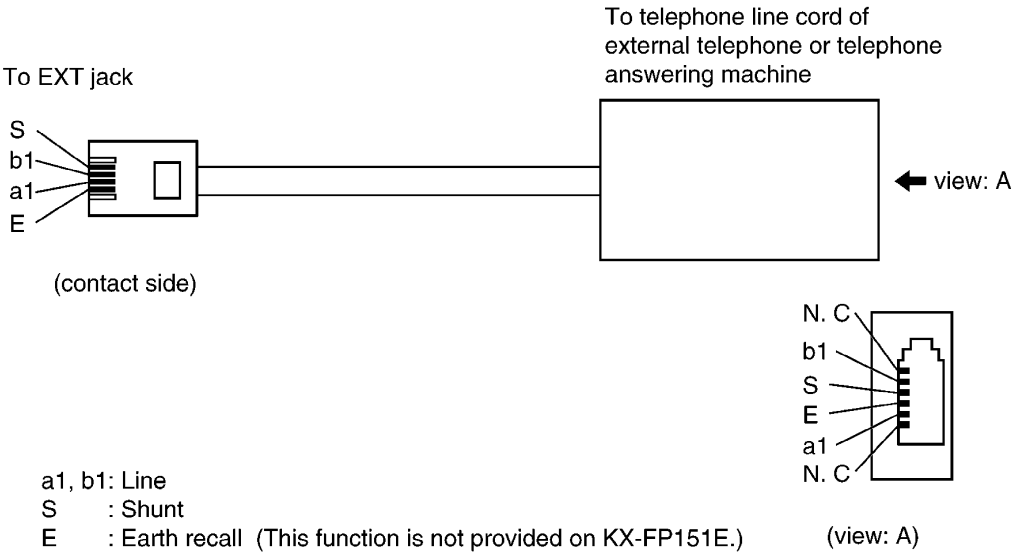
- **If you want to connect an answering machine to the unit, see TAM INTERFACE SECTION ().**
- **Telephone line connection is TNV (Telecommunication Network Voltage.)**

To use the fax machine with a computer on the same line

- **We recommend you use separate wall jacks for the fax machine and the computer.**
- **Set the fax machine to TEL mode.**
- **The device which has the shortest ring setting will answer the call first.**
- **If the computer provides a port for telephone line, connect the fax machine to this port on the computer.**

Extension telephone adaptor for U.K. (sold separately)

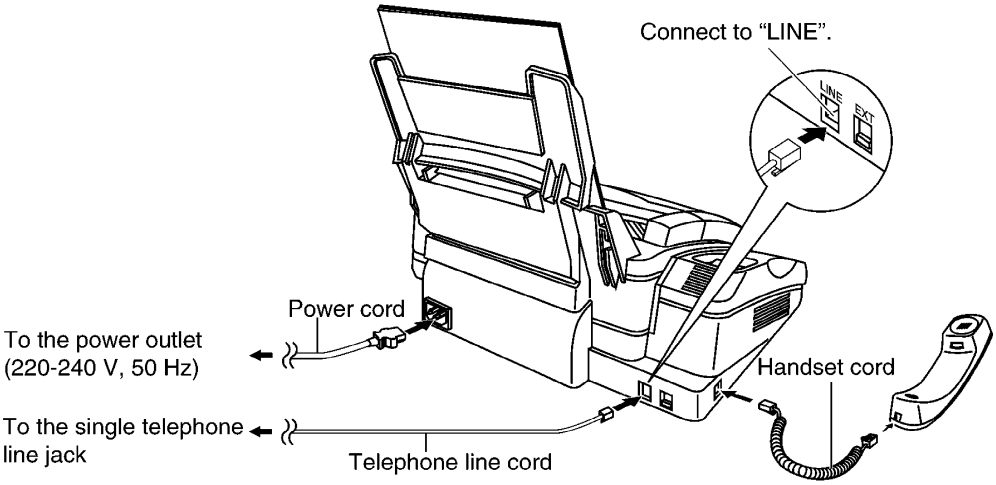
When using the unit with an external answering machine, use an extension telephone adaptor which is sold separately.


To EXT jack
S
b1
a1
E
(contact side)
To telephone line cord of external telephone or telephone answering machine
view: A
N. C
b1
S
E
a1
N. C
(view: A)

a1, b1: Line
S : Shunt
E : Earth recall (This function is not provided on KX-FP151E.)

2.14.2. KX-FP151GR

(1) Connect the handset cord.
(2) Connect the telephone line cord.
(3) Connect the power cord.


Connect to "LINE".
LINE
EXT
Power cord
To the power outlet (220-240 V, 50 Hz)
To the single telephone line jack
Telephone line cord
Handset cord

Caution:

- **When you operate this product, the power outlet should be near the product and easily accessible.**
- **Be sure to use the telephone line cord included in this unit.**
- **Do not extend the telephone line cord.**

Note:

- **If you want to connect an answering machine to the unit, see TAM INTERFACE SECTION ().**

To use the fax machine with a computer on the same line

- **We recommend you use separate wall jacks for the fax machine** and the computer.

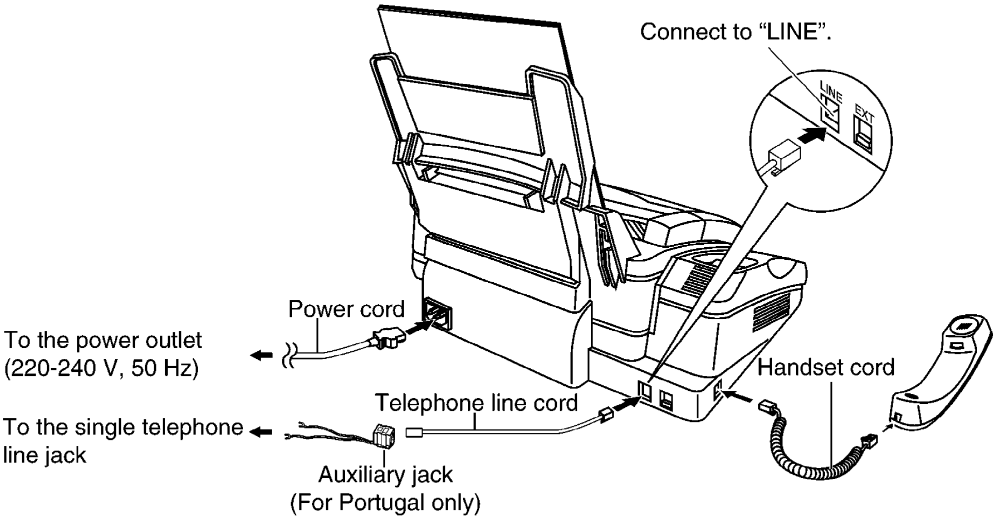
- Set the fax machine to TEL mode.
- The device which has the shortest ring setting will answer the call first.
- If the computer provides a port for telephone line, connect the fax machine to this port on the computer.

2.14.3. KX-FP151SP

(1) Connect the handset cord.

(2) Connect the telephone line cord.

(3) Connect the power cord.


Connect to "LINE".
LINE
EXT
Power cord
To the power outlet
(220-240 V, 50 Hz)
Telephone line cord
Handset cord
To the single telephone line jack
Auxiliary jack
(For Portugal only)

Caution:

- When you operate this product, the power outlet should be near the product and easily accessible.
- Be sure to use the telephone line cord included in this unit.
- Do not extend the telephone line cord.

Note:

- If you want to connect an answering machine to the unit, see TAM INTERFACE SECTION ().

To use the fax machine with a computer on the same line

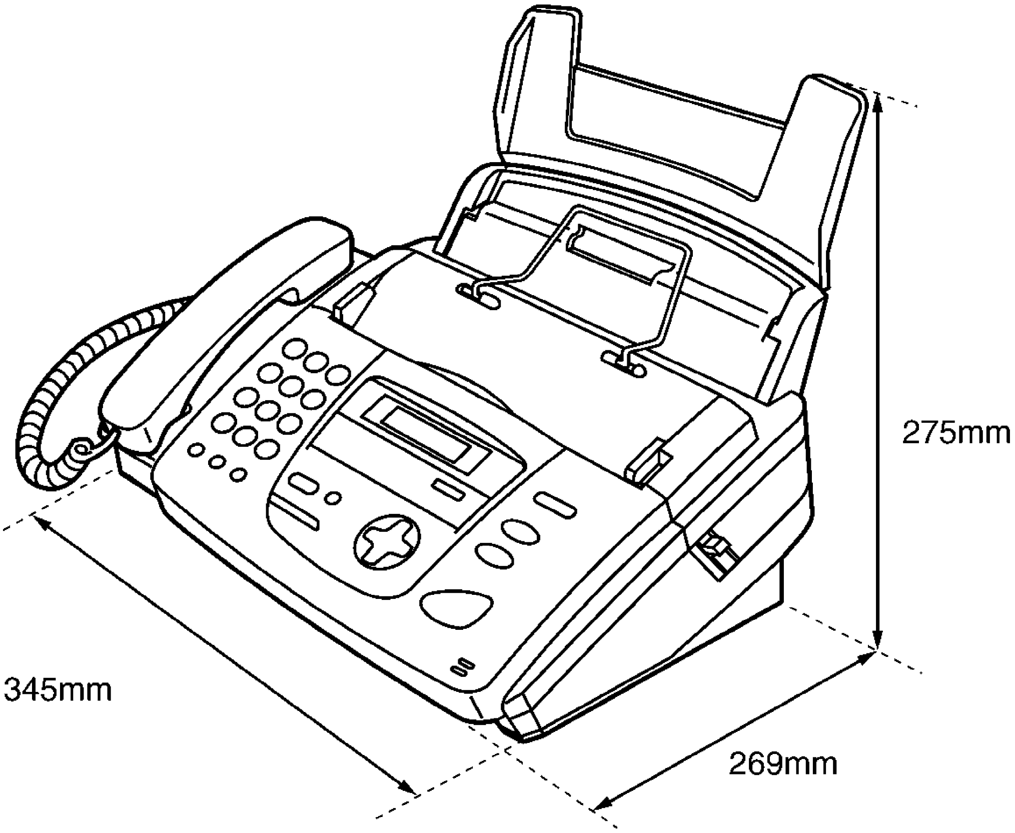
- We recommend you use separate wall jacks for the fax machine and the computer.
- Set the fax machine to TEL mode.
- The device which has the shortest ring setting will answer the call first.
- If the computer provides a port for telephone line, connect the fax

machine to this port on the computer.

2.15. INSTALLATION

2.15.1. INSTALLATION SPACE

The space required to install the unit is shown below.
The dimensions given are necessary for the unit to operate efficiently.



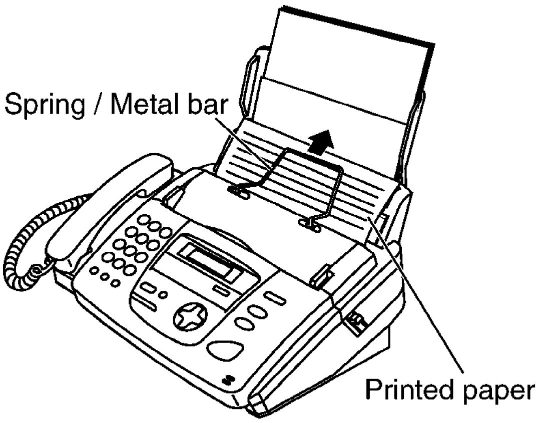
Note:

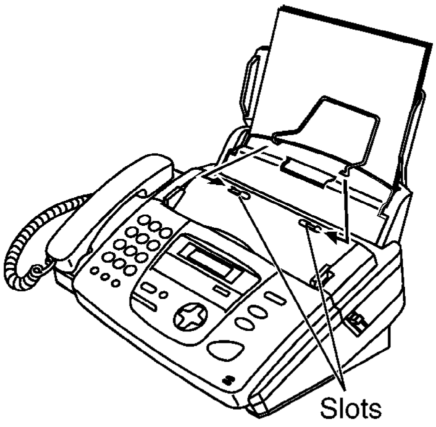
- **Avoid excessive heat or humidity.**
- **Use the unit within the following ranges of temperature and humidity.**
- **Ambient temperature: 5°C to 35°C**
- **Relative humidity: 20% to 80% (without condensation)**
- **Power cord length should be less than 5 meters. Using a longer cord may reduce the voltage or cause malfunctions.**
- **Avoid direct sunlight.**
- **Do not install near devices which contain magnets or generate magnetic fields.**
- **Do not subject the unit to strong physical shock or vibration.**
- **Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.**

- To protect the unit from damage, hold both sides when you move it.

2.15.2. INSTALLING THE SPRING / METAL BAR

The recording paper will be ejected from the top of the unit after printing. The metal bar prevents the printed paper from curling. Do not remove the spring / metal bar.
If the bar comes off, attach it into the slots on the recording paper exit.



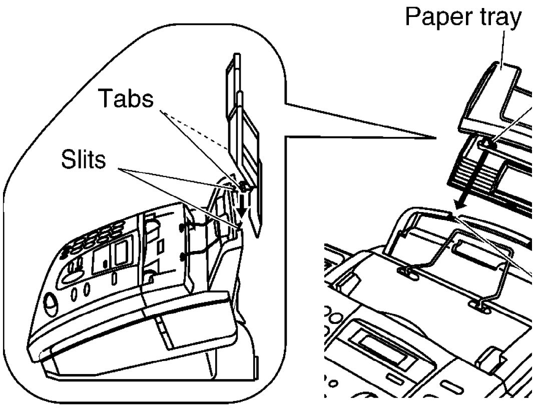


2.15.3. INSTALLING THE PAPER TRAY

Insert tabs on the paper tray into slits on the back of the unit.

Note:

- Do not place the unit in areas where the paper tray may be obstructed by a wall, etc.

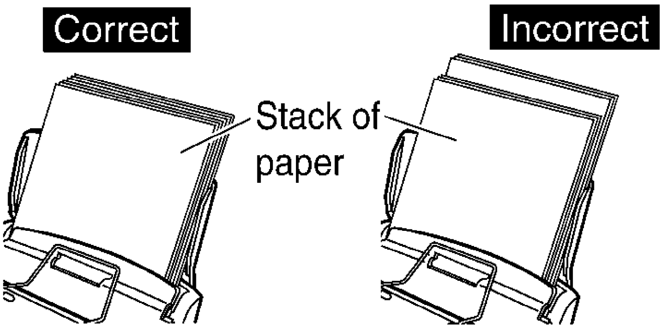


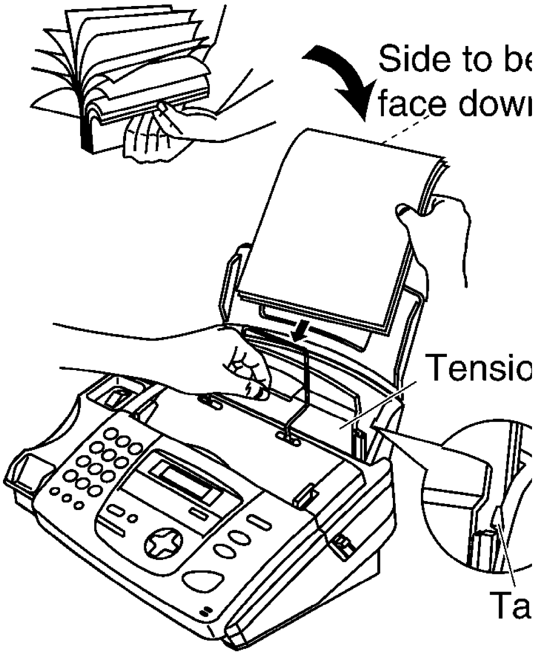
2.15.4. INSTALLING THE RECORDING PAPER

A4-sized recording paper (210 mm × 297 mm) can be loaded. The unit can hold up to 50 sheets of 60 g/m^2 to 75 g/m^2 paper or 30 sheets of 90 g/m^2 paper.

1. Fan the stack of paper to prevent a paper jam.
2. Pull the tension plate forward and hold open while inserting the paper.

-The paper should not be over the tab.
-If the paper is not inserted correctly, readjust the paper or the paper may jam.





Note:

- Do not use the following types of paper:

- Paper with a cotton and / or fibre content that is over 20%, such as letterhead paper or paper used for resumes.

- Extremely smooth or shiny paper, or paper that is highly textured.

- Coated, damaged or wrinkled paper.

- Paper with irregularities, such as tabs or staples.

- Paper which has dust, lint, or oil stains.

- Paper that will melt, vaporize, discolour, scorch or emit dangerous fumes, near 200°C, such as vellum paper. These materials may transfer onto the fusing roller and cause damage.

- Moist paper

- Some paper only accepts print on one side. Try using the other side of the paper if you are not happy with the print quality or if misfeeding occurs.

- For proper feeding and best print quality, we recommend using long-grained paper.

- Do not use paper of different types or thickness at the same time. This may cause a paper jam.

- Avoid double-sided printing.

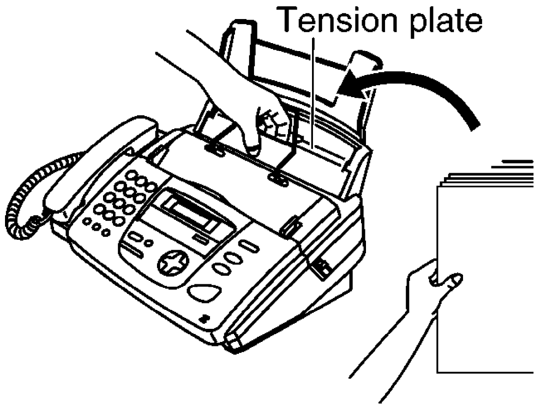
- Do not use paper printed from this unit for double-sided printing

with other copiers or printers. This may cause a paper jam.

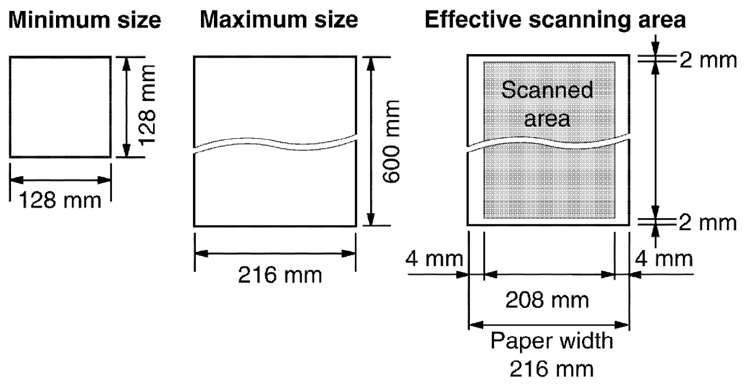
- To avoid curling, do not open paper packs until you are ready to use the paper. Store unused paper in the original packaging, in a cool and dry location.

2.15.5. ADDING PAPER TO THE PAPER TRAY

1. Pull the tension plate forward and hold open while removing all of the installed paper.
2. Add paper to the stack of paper you removed and straighten.
3. Fan the stack of paper.
4. Pull the tension plate forward and hold open while inserting the paper.


Tension plate

2.15.6. DOCUMENTS THE UNIT CAN FEED


Minimum size
128 mm
128 mm
Maximum size
600 mm
216 mm
Effective scanning area
Scanned area
2 mm
2 mm
4 mm
4 mm
208 mm
Paper width
216 mm

Document weight

Single sheet:
45 g/m^2 to 90 g/m^2
(12 lb. to 24 lb.)

Multiple sheets:
60 g/m^2 to 75 g/m^2
(16 lb. to 20 lb.)

Note:

- Remove clips, staples or other similar fasteners.
- Check that ink, paste or correction fluid has dried.
- Do not send the following types of documents. (Use copies for fax transmission.)
  — Chemically treated paper such as carbon or carbonless duplicating paper
  — Electrostatically charged paper
  — Badly curled, creased or torn paper
  — Paper with a coated surface

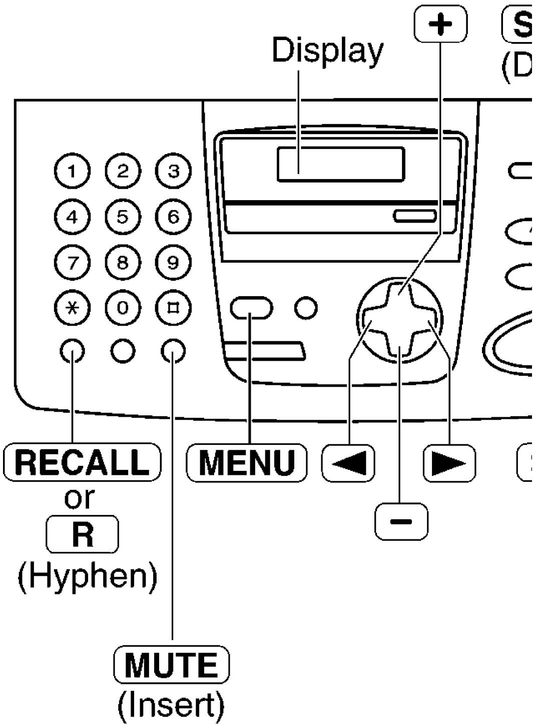
— **Paper with a faint image**

— **Paper with printing on the opposite side that can be seen through the front (e.q. newspaper)**

- To transmit the document(s) with a width of less than A4 size (210 mm), we recommend using a copy machine to copy the original document onto A4 or letter-sized paper, then transmit the copied document.

2.15.7. SETTING YOUR LOGO

The logo can be your company, division or name.



1. Press MENU.
Display:

2. Press ◄ or ► until the following is displayed.

3. Press SET.

4. Enter your logo, up to 30 characters, by using the dial keypad.
Example: Bill
   - A. Press 2 2 times.
   - B. Press 4 6 times.
   - C. Press 5 6 times.
   - D. Press ► to move the cursor to the next space and press 5 6 times.

5. Press SET.
~ The next feature will be displayed.

6. Press MENU.

Note:

- You can enter your logo by pressing + or − .

To correct a mistake

-Press ◄ or ► to move the cursor to the incorrect character, then make the correction.

To delete a character

-Move the cursor to the character you want to delete and press STOP.

To insert a character

1. Press ◄ or ► to move the cursor to the position to where you want to insert the character.
2. Press MUTE (Insert) to insert a space and enter the

2.15.8. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

Pressing the dial keys will select a character as shown below.

2.15.8.1. KX-FP151E, KX-FP151GR

Keys	Characters
①	1 [ ] { } + - / = , . _ ` : ; ? |
②	A B C a à b c 2
③	D E F d e è f 3
④	G H I g h i ì 4
⑤	J K L j k l 5
⑥	M N O m n o ò 6
⑦	P Q R S p q r s 7
⑧	T U V t u ù v 8
⑨	W X Y Z w x y z 9
⓪	0 ( ) 〈 〉 ! " # $ % & ¥ * @ ^ ' →
RECALL or R	**Hyphen** button (To insert a hyphen.)
MUTE	**Insert** button (To insert one character or one space.)
STOP	**Delete** button (To delete a character.)
▶	▶ key (To move the cursor to the right.) To enter another character using the same number key, move the cursor to the next space.
◀	◀ key (To move the cursor to the left.)

2.15.8.2. KX-FP151SP

Keys	Characters
①	1 [ ] { } + - / = , . _ ` : ; ? |
②	A B C a b c 2
③	D E F d e f 3
④	G H I g h i 4
⑤	J K L j k l 5
⑥	M N O m n o 6
⑦	P Q R S p q r s 7
⑧	T U V t u v 8
⑨	W X Y Z w x y z 9
⓪	á é í ó ñ 0 ( ) 〈 〉 ! " # $ % & ¥ * @ ^ ' →
R	**Hyphen** button (To insert a hyphen.)
MUTE	**Insert** button (To insert one character or one space.)
STOP	**Delete** button (To delete a character.)
▶	▶ key (To move the cursor to the right.) To enter another character using the same number key, move the cursor to the next space.
◀	◀ key (To move the cursor to the left.)

- **If you select “PORTUGUESE” in language (feature #48 on REMOTE PROGRAMMING ()), you can select the following characters using the 0 button.**

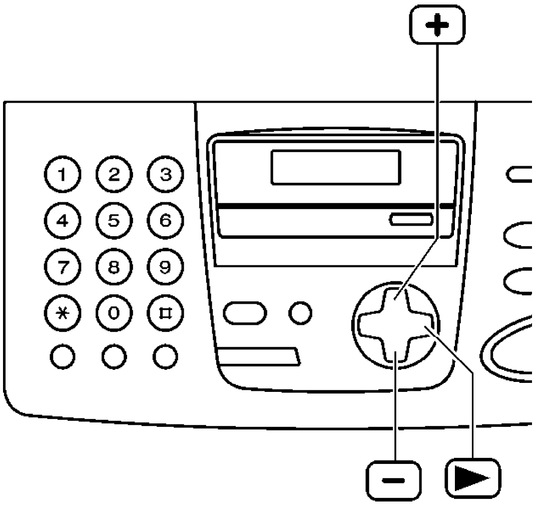
Keys	Characters
⓪	Á É Ã Õ Ç 0 ( ) 〈 〉 ! " # $ % & ¥ * @ ^ ' →

2.15.9. TO SELECT CHARACTERS USING ⊞ or ⊟

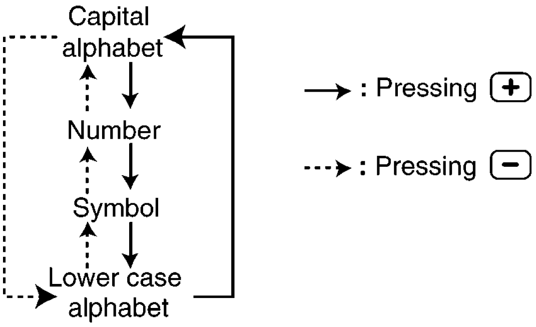
Instead of pressing the dial keys, you can select characters using ⊞ or ⊟

1. Press ⊞ or ⊟ until the desired character is displayed.
2. Press ▶ to move the cursor to the next space.

-The character displayed in step 1 is inserted.
3. Return to step 1 to enter the next character.


+
1
2
3
4
5
6
7
8
9
*
0
#
−
▶

Display order of characters


Capital alphabet
Number
Symbol
Lower case alphabet
: Pressing +
: Pressing −

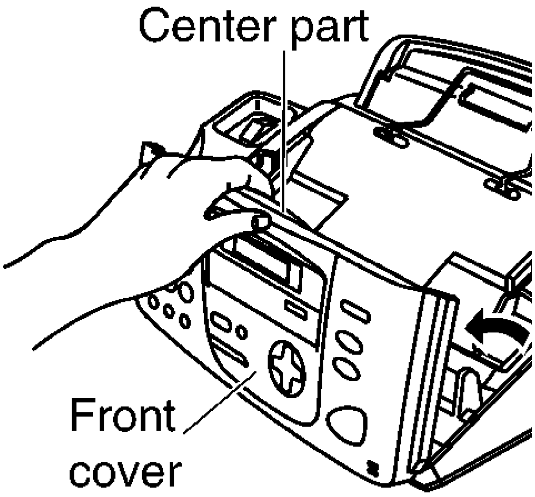
2.15.10. INSTALLING / REPLACING THE FILM CARTRIDGE

When the unit runs out of the ink film, the following message will be displayed.
Display:

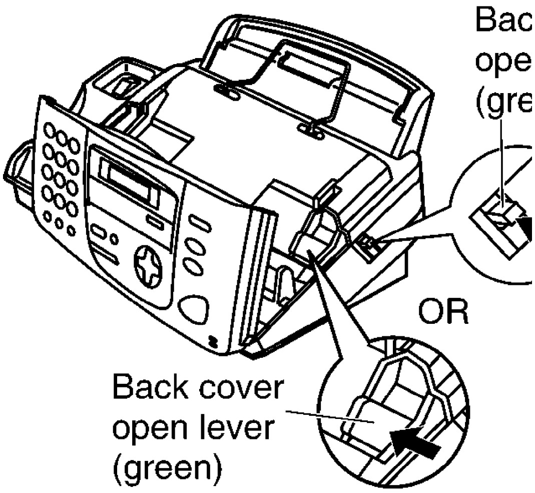
```
CHECK FILM
```

Install a new ink film. The following ink film is available for replacement. Each roll prints about 140 A4-sized pages.
Refer to OPTIONAL ACCESSORIES.()
Model No. KX-FA55X: Replacement film (2 rolls)

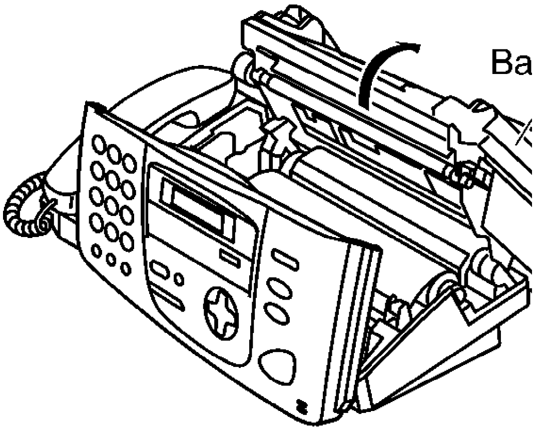
1. Open the front cover by pulling up the centre part.


Center part
Front cover

2. Push the back cover open button (green) on the right side of the unit.
OR
Push the back cover open lever (green) inside of the unit.

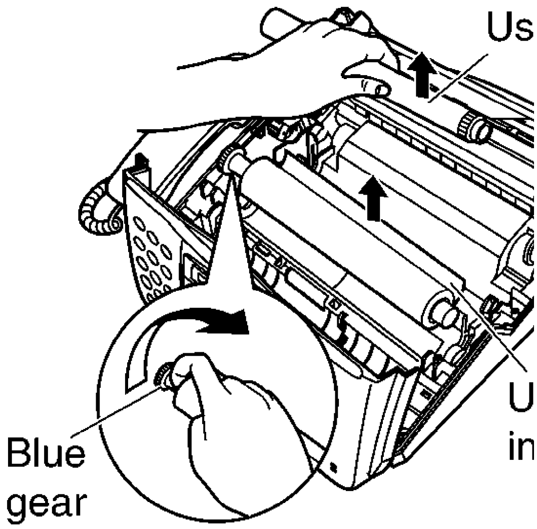

Bac
ope
(gre
OR
Back cover open lever (green)

3. Open the back cover.
For the first time installation of the supplied ink film, skip to step 6.



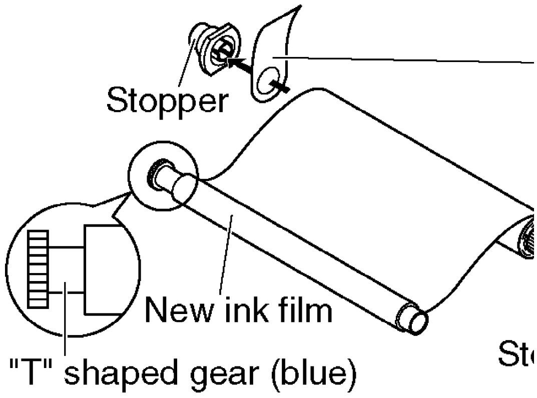
For replacement only

4. Pull up the blue gear side and remove the used ink film. Remove the used core.

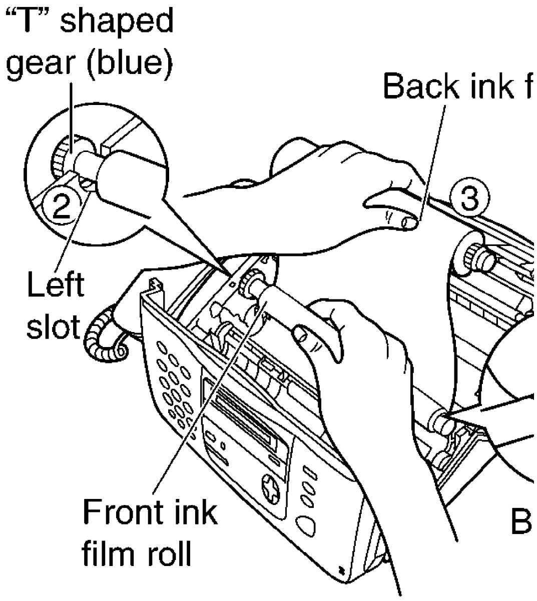

Us
Blue
gear
U
in

For replacement only

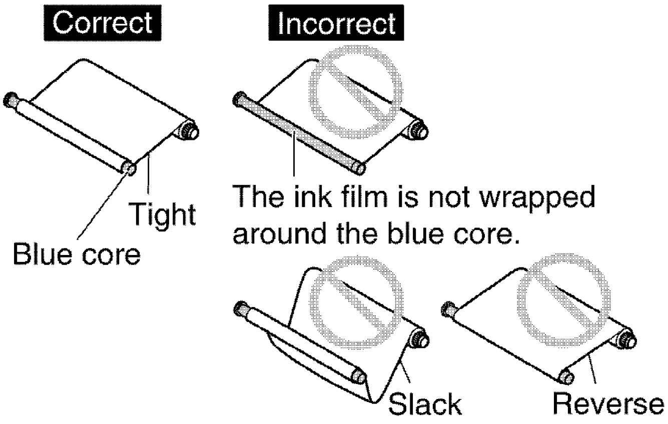
5. Remove the stoppers and tags from the new ink film. Find the “T” shaped gear (blue).

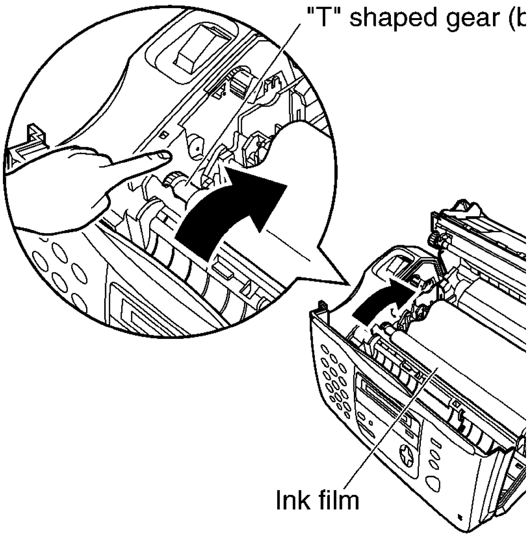

Stopper
New ink film
"T" shaped gear (blue)
St

6. Insert the blue core of the front ink film roll into the right slot of the unit (①). Insert the “T” shaped gear (blue) into the left slot of the unit (②). Insert the rear ink film roll (③).


“T” shaped
gear (blue)
Back ink f
③
②
Left
slot
Front ink
film roll
B

7. Turn the “T” shaped gear (blue) in the direction of arrow.


Correct
Incorrect
Tight
Blue core
The ink film is not wrapped around the blue core.
Slack
Reverse


"T" shaped gear (b
Ink film

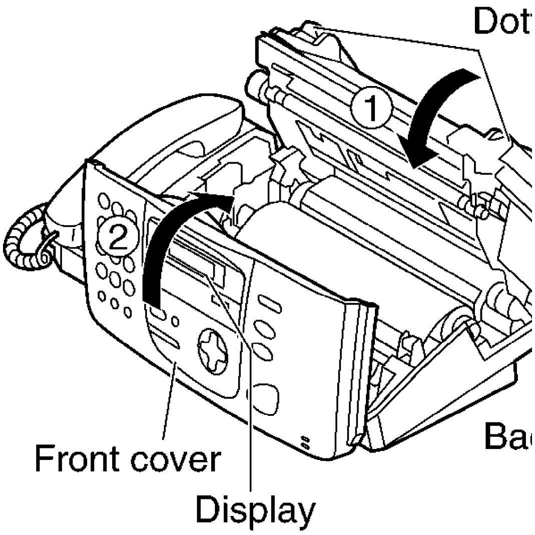
-Make sure that the ink film is wrapped around the blue core at least once.

8. Close the back cover securely by pushing down on the dotted area at both ends (①).

Close the front cover securely (②).

-The following message will be displayed while the unit is checking that there is no slack on the ink film.

Display:


Dot
1
2
Front cover
Display
Ba

Note:

- The ink film is completely safe to touch, and will not rub off on your hands like carbon paper.

2.16. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

2.16.1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1. Periodic maintenance

Inspect the equipment periodically and if necessary, clean any contaminated parts.

2. Check for breakdowns

Look for problems and consider how they arose.

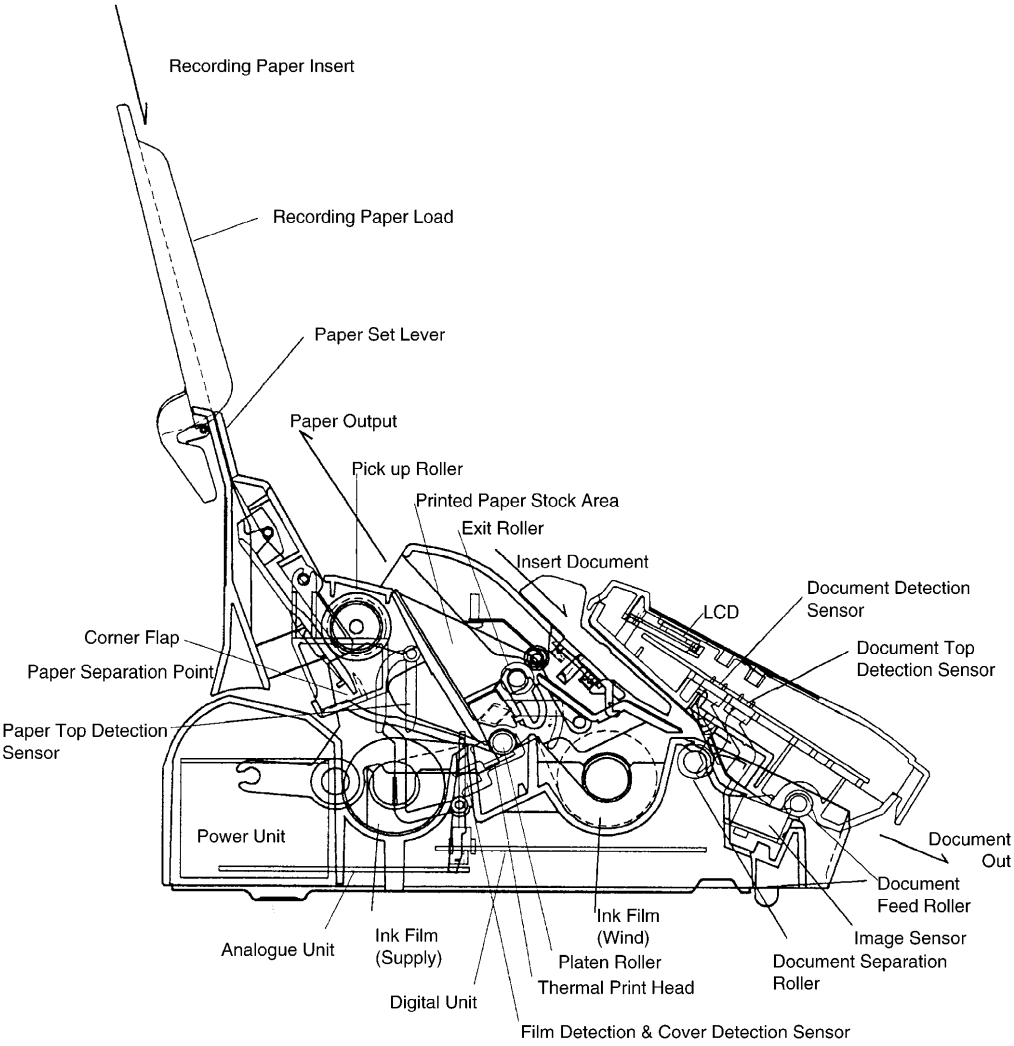
If the equipment can be still used, perform copying, self testing or communication testing.

3. Check equipment

Perform copying, self testing and communication testing to determine if the problem originates from the transmitter, receiver or the telephone line.

4. **Determine causes**
   Determine the causes of the equipment problem by troubleshooting.
5. **Equipment repairs**
   Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.
6. **Confirm normal operation of the equipment**
   After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.
7. **Record keeping**
   Make a record of the measures taken to rectify the problem for future reference.

2.16.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS


Recording Paper Insert
Recording Paper Load
Paper Set Lever
Paper Output
Pick up Roller
Printed Paper Stock Area
Exit Roller
Insert Document
Document Detection Sensor
LCD
Document Top Detection Sensor
Corner Flap
Paper Separation Point
Paper Top Detection Sensor
Power Unit
Document Out
Document Feed Roller
Image Sensor
Document Separation Roller
Ink Film (Wind)
Platen Roller
Thermal Print Head
Analogue Unit
Ink Film (Supply)
Digital Unit
Film Detection & Cover Detection Sensor

2.16.2.1. MAINTENANCE LIST

NO.	OPERATION	CHECK	REMARKS
1	Document Path	Remove any foreign matter such as paper.	—
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	Refer to MAINTENANCE(
3	Platen Roller	If the platen is dirty, clean it with a damp cloth then dry thoroughly. Remove the paper and film cartridge before cleaning.	—
4	Thermal Head	If the thermal head is dirty, clean the printing surface with a cloth moistened with denatured alcohol (alcohol without water), then dry thoroughly.	Refer to MAINTENANCE(
5	Sensors	Hook switch (SW101), Paper top sensor (PS501), Film end/Cover open switch (SW501), Document top switch (SW353), Document set switch (SW352). Confirm the operation of the sensors.	See MAINTENANCE CHE ITEMS/COMPONENT LOCATIONS() and HOW REMOVE THE ANALOGU DIGITAL AND POWER BOARDS AND AC INLET
6	Glass	If the glass is dirty, clean with a dry soft cloth.	Refer to MAINTENANCE(
7	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

2.16.2.2. MAINTENANCE CYCLE

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Procedu
1	Separation Roller (Ref. No. 117)	3 months	7 years* (100,000 documents)	Refer to HOW T REMOVE THE SEPARATION F
2	Separation Rubber (Ref. No. 5)	3 months	7 years (100,000 documents)	Refer to MAINT CHECK ITEMS/ COMPONENT LOCATIONS().
3	Feed Rollers (Ref. No. 4)	3 months	7 years (100,000 documents)	Refer to DISAS INSTRUCTIONS
4	Thermal Head (Ref. No. 33)	3 months	7 years (100,000 documents)	Refer to HOW T REMOVE THE T HEAD().
5	Platen Roller (Ref. No. 93)	3 months	7 years (100,000 documents)	Refer to HOW T REMOVE THE F ROLLER, BACK ().
6	Pickup Roller (Ref. No. 72)	3 months	7 years (100,000 documents)	Refer to HOW T REMOVE THE F ROLLER().

2.16.3. MAINTENANCE

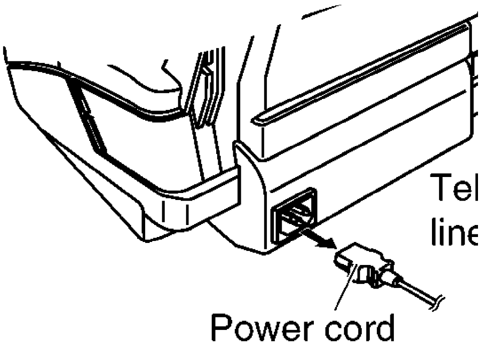
2.16.3.1. CLEANING THE DOCUMENT FEEDER UNIT

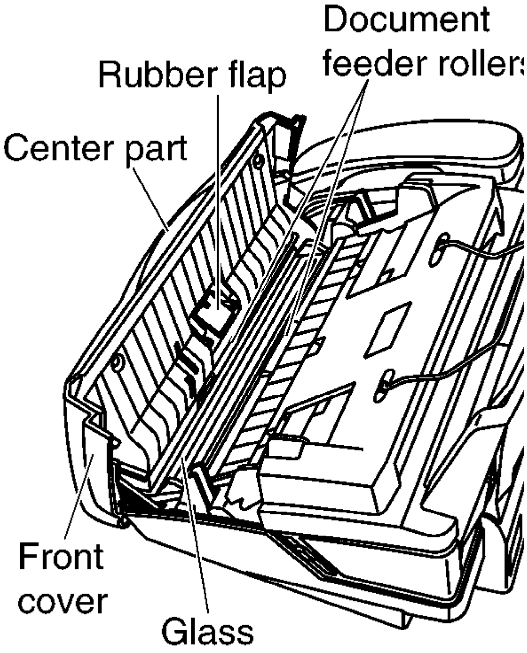
If misfeeding occurs frequently or if dirty patterns or bands appear on a transmitted document or on the original of a copied document, clean the document feeder.

1. Disconnect the power cord and the telephone line cord.
2. Open the front cover by pulling up the centre part.
3. Clean the document feeder rollers and rubber flap with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.
4. Clean the glass with a soft dry cloth.
5. Close the front cover securely.
6. Connect the power cord and the telephone line cord.

Caution:

- Do not use paper products, such as paper towels or tissues, to clean the inside of the unit.





2.16.3.2. CLEANING THE THERMAL HEAD AND BLACK BAR

If dirty patterns or black or white bands appear on a copied or received document, check whether there is dust on the thermal head and clean the thermal head to remove the dust.

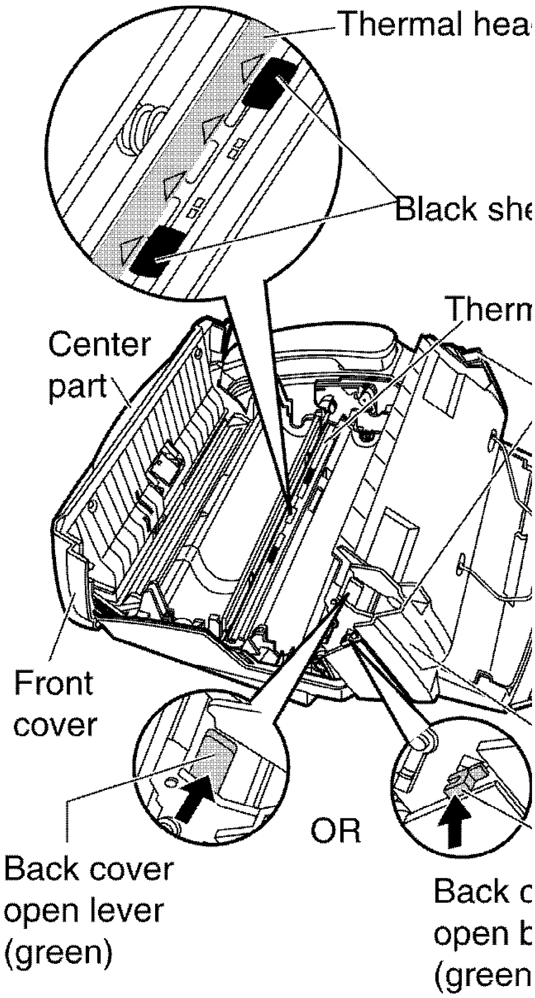
1. Disconnect the power cord and the telephone line cord.
2. Open the front cover by pulling up the centre part.
3. Open the back cover by pushing the back cover open button (green) or pushing the back cover open lever (green).
4. Clean the thermal head with a cloth moistened with isopropyl rubbing alcohol, and let it dry thoroughly.

-Do not touch the black sheets on the thermal head.

5. Close the back cover securely by pushing down on the dotted area at both ends. Close the front cover securely.
6. Connect the power cord and the telephone line cord.

Caution:

- To prevent a malfunction due to static electricity, do not use a dry cloth and do not touch the thermal head directly.



2.16.3.3. CLEANING THE PICKUP ROLLER

Refer to HOW TO REMOVE THE PICKUP ROLLER.()

3. TROUBLESHOOTING GUIDE

3.1. TROUBLESHOOTING SUMMARY

3.1.1. TROUBLESHOOTING

After confirming the problem by asking the user, troubleshoot according to the instructions and observe the following precautions.

3.1.2. PRECAUTIONS

1. If there is a problem with the print quality or the paper feed, first check if the installation space and the print paper meets the specifications, the paper selection lever/paper thickness lever is set correctly, and the paper is set correctly without any slack.
2. Before troubleshooting, first check that the connectors and

cables are connected correctly (not loose).
If the problem occurs randomly, check it very carefully.

3. When connecting the AC power cord with the unit and checking the operation, exercise utmost care when handling electric parts in order to avoid electric shocks and short-circuits.
4. After troubleshooting, double check that you have not forgotten any connectors, left any loose screws, etc.
5. Always test to verify that the unit is working normally.

3.1.3. WHEN YOU DON'T KNOW HOW TO OPERATE THE UNIT, USE THE HELP FUNCTION

- How to use:

1. press HELP.
2. press ◄ or ► until the desired item is displayed.
3. press SET.

3.2. USER RECOVERABLE ERRORS

If the unit detects a problem, one or more of the following messages will appear on the display.

DISPLAY MESSAGE	CAUSE AND REMEDY
CALL SERVICE CALL SERVICE 2	-There is something wrong with the unit. [This error is displayed when the thermal head does not warm up. Check the thermistor on the therma connector lead (for technicians).]
CHECK DOCUMENT	-The document is not fed into the unit properly. Reinsert the document. If misfeeding occurs frequentl document feeder rollers and try again. [Refer to CLEANING THE DOCUMENT FEEDER UNIT ()]
CHECK MEMORY	-The memory (telephone numbers, parameters, etc.) has been erased. Re-program.
CHECK PAPER	-The recording paper is not installed or the unit has run out of paper. Install paper and press SET t message. -The recording paper is not fed into the unit properly. Reinstall paper and press SET to clear the m Refer to INSTALLING THE RECORDING PAPER ()] -The recording paper has jammed near the recording paper entrance. Clear the jammed paper and pre to clear the message. Do not install folded or heavily curled paper. [Refer to RECORDING PAPER JAM
COVER OPEN ↕ CHECK FILM	-The covers are open. Close them. -The ink film is empty. Replace the ink film with a new one. [Refer to INSTALLING / REPLACING THE CARTRIDGE ()] -The ink film is not installed. Install it. [Refer to INSTALLING / REPLACING THE FILM CARTRIDGE ()] -The ink film is slack. Tighten it. [Refer to Step 7 on INSTALLING / REPLACING THE FILM CARTRIDGE

DISPLAY MESSAGE	CAUSE AND REMEDY
DIRECTORY FULL	-There is no space to store new entries in the directory. Erase unnecessary entries.
FAX IN MEMORY	-The unit has a document in memory. See the other displayed message instructions to print out the d
FAX MEMORY FULL	-The memory is full of received documents due to a lack of recording paper or a recording paper jam. or clear the jammed paper. -When performing memory transmission, the document being stored exceeds the memory capacity of Transmit the entire document manually.
MEMORY FULL	-When making a copy, the document being stored exceeds the memory capacity of the unit. Press S clear the message. Divide the document into sections.
MODEM ERROR	-There is something wrong with the modem circuit.
NO FAX REPLY	-The other party´s fax machine is busy or has run out of recording paper. Try again.
PAPER JAMMED	-A recording paper jam occurred. Clean the jammed paper. [If the printout jams, refer to RECORDING PAPER JAMS ().]
PLEASE WAIT	-The unit is checking that there is no slack on the ink film. Wait for a while.
POLLING ERROR	-The other party’s fax machine does not provide the polling function. Check with the other party.
REDIAL TIME OUT	-The other party´s fax machine is busy or has run out of recording paper. Try again.
REMOVE DOCUMENT	-The document is jammed. Remove the jammed document. [Refer to RECORDING PAPER JAMS ()] -Attempted to transmit a document longer than 600 mm (23 5/8”). Press the STOP to remove the d Divide the document into two or more sheets and try again. -[Alternately, turn off service code #559 to enable sending of documents longer than 600 mm] (Refer t DOCUMENT JAMS ().)
TRANSMIT ERROR	-A transmission error occurred. Try again.
UNIT OVERHEATED	-The unit is too hot. Let the unit cool down. [If any copies are nearly all black, this message will displayed. When this occurs, open the front cove unit cool down.]

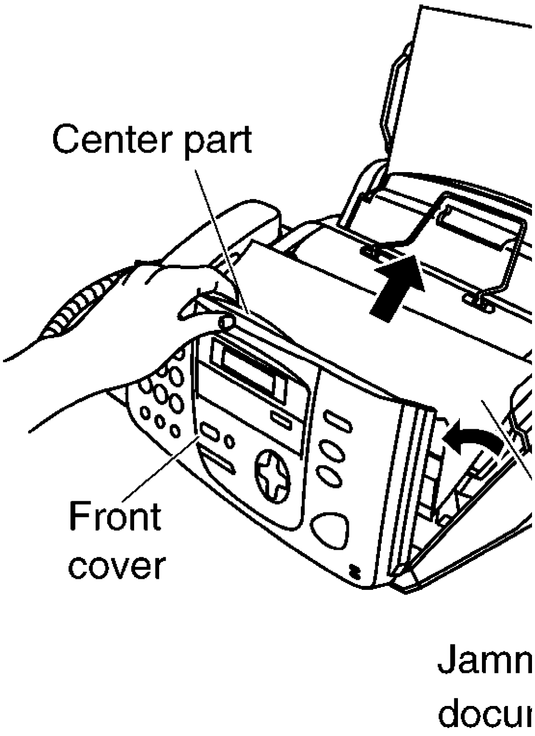
Note:

The explanations given in the [ ] are for servicemen only.

3.2.1. DOCUMENT JAMS

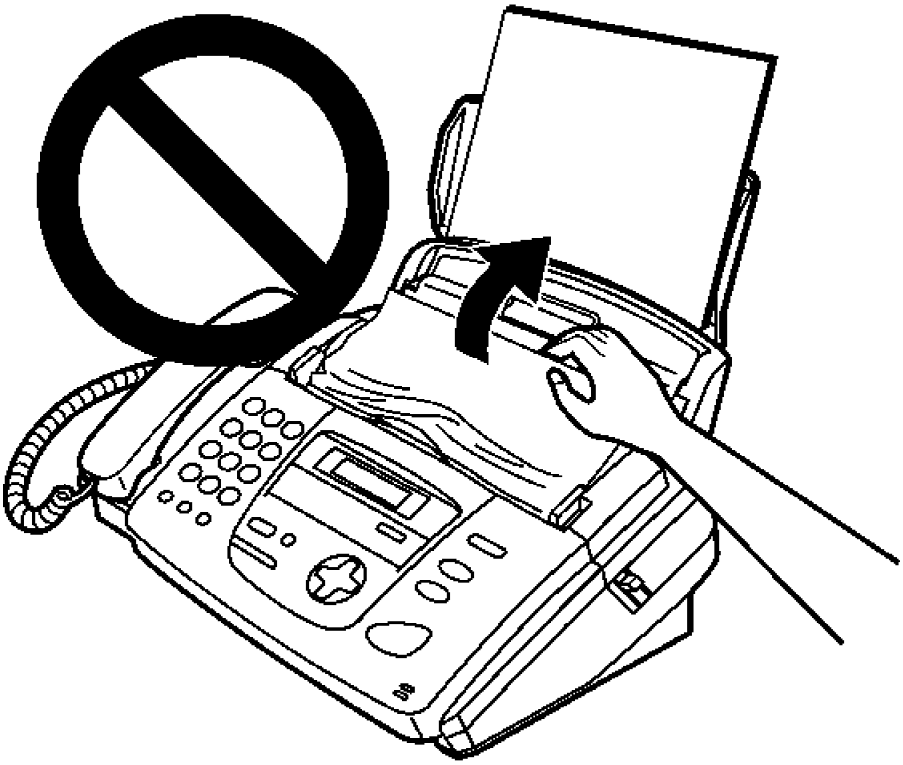
If the unit does not release the document during feeding, remove the jammed document as follows.

1. Open the front cover by pulling up the centre part.
2. Remove the jammed document carefully.
3. Close the front cover securely.


Center part
Front cover
Jamn
docu

Note:

- Do not pull out the jammed paper forcibly before opening the front cover.



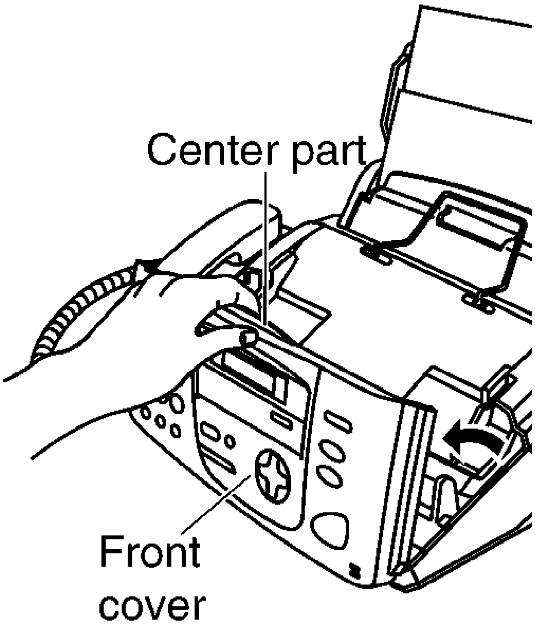
3.2.2. RECORDING PAPER JAMS

If the unit does not eject any recording paper during fax reception or copying, the recording paper has jammed and the display will show the following massage.
Display:

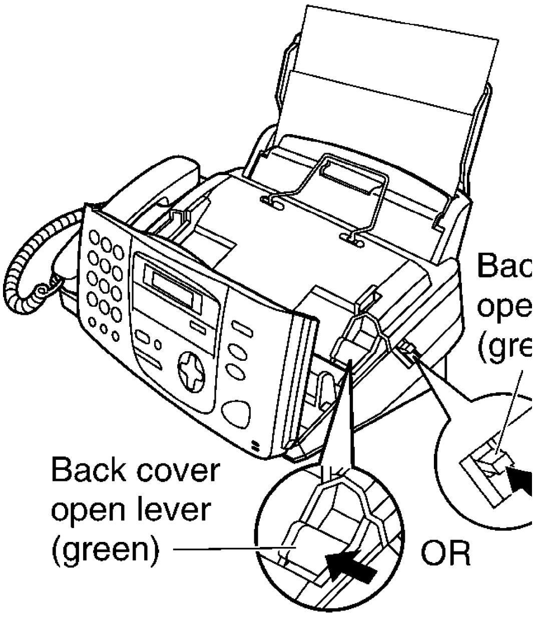
```
PAPER JAMMED
```

Remove the jammed paper as follows.

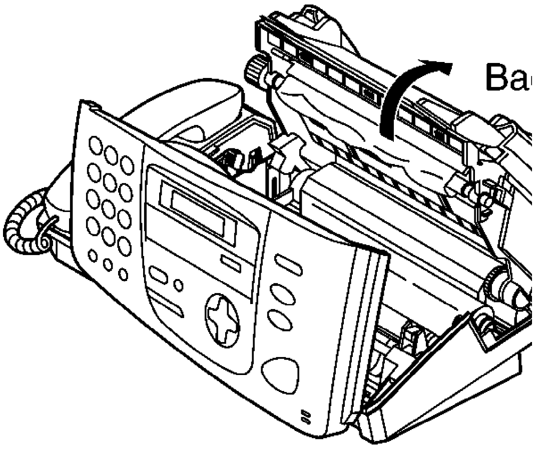
1. Open the front cover by pulling up the centrecentre part.


Center part
Front cover

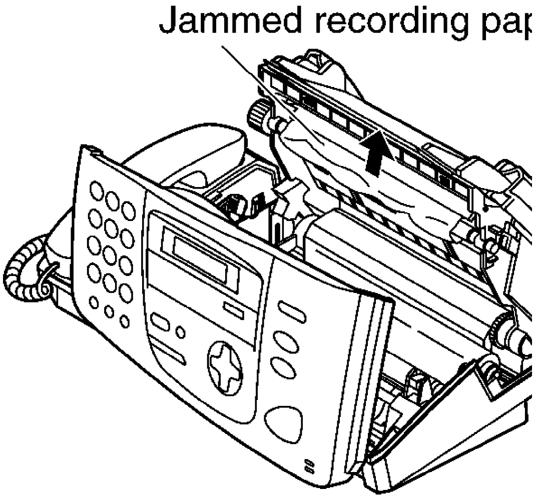
2. Push the back cover open button (green) on the right side of the unit.
OR
Push the back cover open lever (green) inside of the unit.


Bac
ope
(gre
Back cover open lever (green)
OR

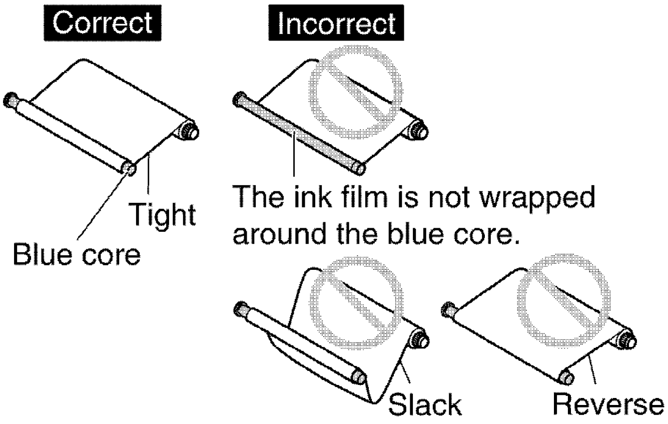
3. Open the back cover.

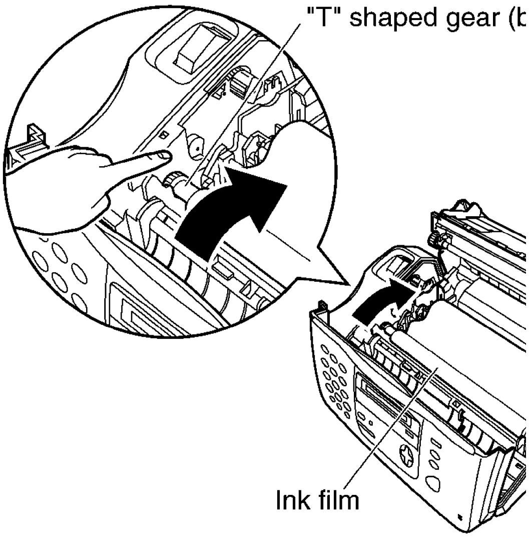


4. Remove the jammed recording paper.


Jammed recording pa

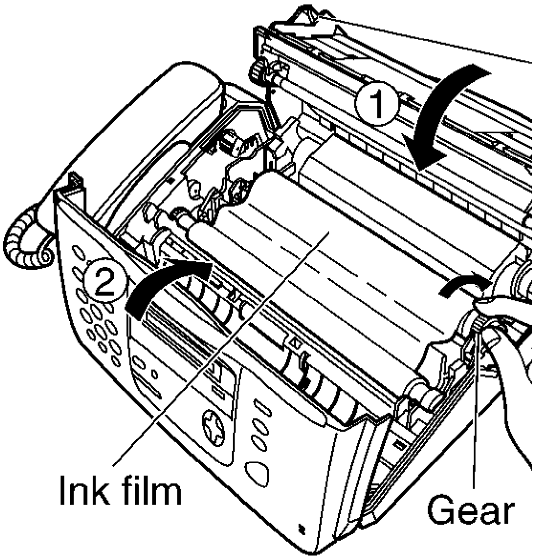
5. Turn the “T” shaped gear (blue) in the direction of arrow.


Correct
Incorrect
Tight
Blue core
The ink film is not wrapped around the blue core.
Slack
Reverse


"T" shaped gear (b
Ink film

-Make sure that the ink film is wrapped around the blue core at least once.

6. Close the back cover securely by pushing down on the dotted area at both ends (①).
Close the front cover securely (②).



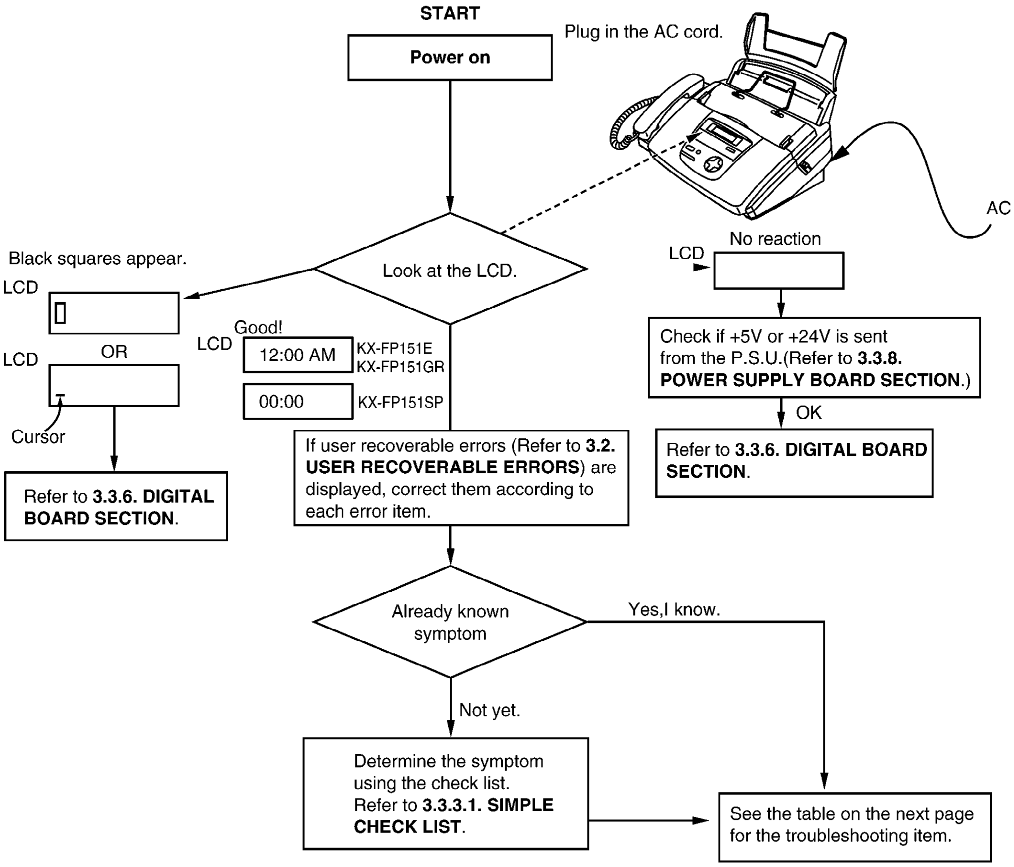
3.3. TROUBLESHOOTING DETAILS

3.3.1. OUTLINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on SIMPLE CHECK LIST(). Difficult problems may be hard to determine, so repeated testing is necessary.

3.3.2. STARTING TROUBLESHOOTING

Determine the symptom and the troubleshooting method.


START
Power on
Plug in the AC cord.
AC
Look at the LCD.
Black squares appear.
LCD
LCD
OR
Cursor
Refer to 3.3.6. DIGITAL BOARD SECTION.
Good!
LCD
12:00 AM
KX-FP151E
KX-FP151GR
00:00
KX-FP151SP
No reaction
LCD
Check if +5V or +24V is sent from the P.S.U.(Refer to 3.3.8. POWER SUPPLY BOARD SECTION.)
OK
Refer to 3.3.6. DIGITAL BOARD SECTION.
If user recoverable errors (Refer to 3.2. USER RECOVERABLE ERRORS) are displayed, correct them according to each error item.
Already known symptom
Yes,I know.
Not yet.
Determine the symptom using the check list. Refer to 3.3.3.1. SIMPLE CHECK LIST.
See the table on the next page for the troubleshooting item.

CROSS REFERENCE:

SIMPLE CHECK LIST()

DIGITAL BOARD SECTION()

POWER SUPPLY BOARD SECTION()

3.3.3. TROUBLESHOOTING ITEMS TABLE

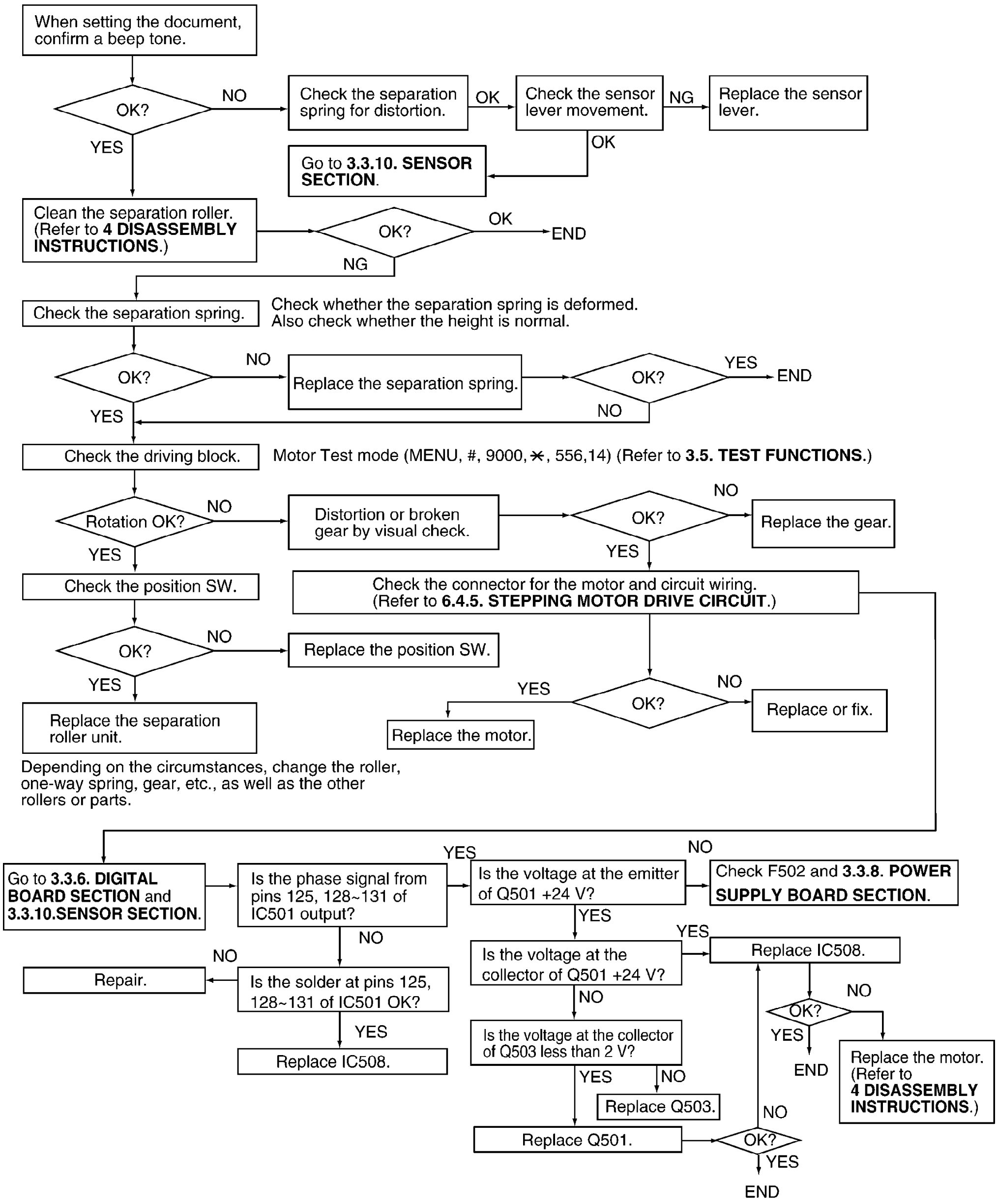
ITEM	SYMPTOM	REFERENCE
ADF (Auto Document Feeder)	The document does not feed.	See NO DOCUMENT FEED ()
	Document jam	See DOCUMENT JAM ()
	Multiple feed	See MULTIPLE FEED ()
	Skew	See SKEW ()
Recording paper feed	The recording paper does not feed.	See THE RECORDING PAPER DOES NO
	Paper jam	See PAPER JAM ()
	Multiple feed and skew	See MULTIPLE FEED AND SKEW ()
Printing	The sent fax data is skewed.	See THE SENT FAX DATA IS SKEWED (
	The received fax data is skewed.	See THE RECEIVED FAX DATA IS SKEW
	The received or copied data is expanded.	See RECEIVED OR COPIED DATA IS EX ()
	A blank page is copied.	See A BLANK PAGE IS COPIED ()
	A blank page is received.	See A BLANK PAGE IS RECEIVED ()
	Black or white vertical line	See BLACK OR WHITE VERTICAL LINE
	Black or white lateral line	See BLACK OR WHITE LATERAL LINE (OUT ()
	An abnormal image is printed	See AN ABNORMAL IMAGE IS PRINTED
Communication FAX, TEL (analog board)	Cannot communicate by fax.	See COMMUNICATION SECTION ()
	An error code is displayed.	See DEFECTIVE FACSIMILE SECTION (
	Cannot talk. The DTMF tone doesn’t work. The handset / monitor doesn’t work, etc.	See ANALOGUE BOARD SECTION ()
Operation panel	Keys are not accepted.	See OPERATION PANEL SECTION ()
Sensor	If the electric circuit is the cause, the error message corresponding to the sensor will be displayed.	See SENSOR SECTION ()

3.3.3.1. SIMPLE CHECK LIST

SERIAL NO.		DATE	
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation		OK / NG	
Telephone operation	Handset transceiver / receiver	OK / NG	
	MONITOR sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
	VOX detection	OK / NG	Service code #815 (Refer t FUNCTIONS ())
Operation Panel	Key check	OK / NG	Service code #561 (Refer t FUNCTIONS ())
	LED check	OK / NG	Service code #557 (Refer t FUNCTIONS ())
	LCD check	OK / NG	Service code #558 (Refer t FUNCTIONS ())
Sensor	Sensor check	OK / NG	Service code #815 (Refer t FUNCTIONS ())
Clock	Display changing	OK / NG	Is the time kept correctly? Check with another clock.
Digital Speaker phone		OK / NG	
EXT-TAM	Handset transceiver / receiver	OK / NG	
	Remote Control	OK / NG	

3.3.4. ADF (Auto Document Feed) SECTION

3.3.4.1. NO DOCUMENT FEED


When setting the document, confirm a beep tone.
OK?
NO
YES
Check the separation spring for distortion.
OK
Check the sensor lever movement.
NG
Replace the sensor lever.
OK
Go to **3.3.10. SENSOR SECTION**.
Clean the separation roller. (Refer to **4 DISASSEMBLY INSTRUCTIONS**.)
OK?
OK
END
NG
Check the separation spring.
Check whether the separation spring is deformed. Also check whether the height is normal.
OK?
NO
YES
Replace the separation spring.
OK?
YES
END
NO
Check the driving block.
Motor Test mode (MENU, #, 9000, ✱, 556,14) (Refer to **3.5. TEST FUNCTIONS**.)
Rotation OK?
NO
YES
Distortion or broken gear by visual check.
OK?
NO
Replace the gear.
YES
Check the position SW.
Check the connector for the motor and circuit wiring. (Refer to **6.4.5. STEPPING MOTOR DRIVE CIRCUIT**.)
OK?
NO
YES
Replace the position SW.
OK?
YES
NO
Replace or fix.
Replace the motor.
Replace the separation roller unit.
Depending on the circumstances, change the roller, one-way spring, gear, etc., as well as the other rollers or parts.
Go to **3.3.6. DIGITAL BOARD SECTION** and **3.3.10.SENSOR SECTION**.
Is the phase signal from pins 125, 128~131 of IC501 output?
YES
Is the voltage at the emitter of Q501 +24 V?
NO
Check F502 and **3.3.8. POWER SUPPLY BOARD SECTION**.
NO
YES
Is the solder at pins 125, 128~131 of IC501 OK?
NO
Repair.
YES
Replace IC508.
Is the voltage at the collector of Q501 +24 V?
YES
Replace IC508.
NO
OK?
NO
YES
END
Replace the motor. (Refer to **4 DISASSEMBLY INSTRUCTIONS**.)
Is the voltage at the collector of Q503 less than 2 V?
YES
NO
Replace Q503.
NO
Replace Q501.
OK?
YES
END

CROSS REFERENCE:

DIGITAL BOARD SECTION()

POWER SUPPLY BOARD SECTION()

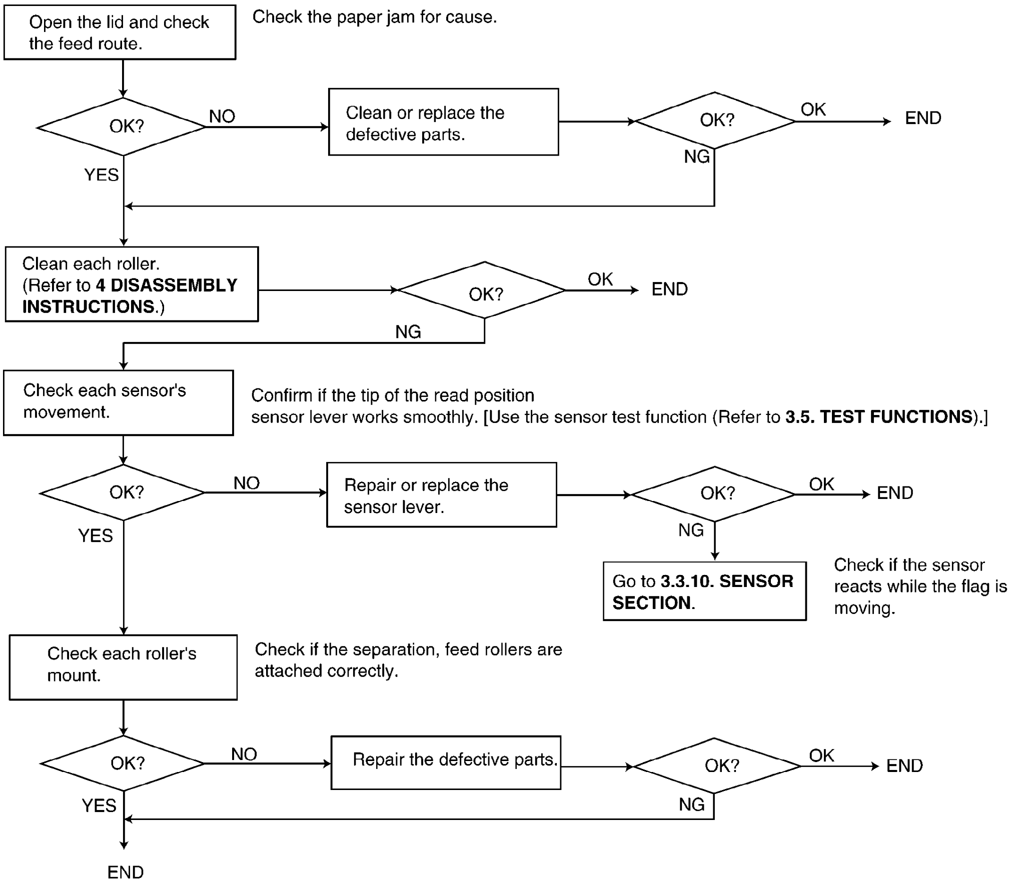
SENSOR SECTION()

TEST FUNCTIONS()

DISASSEMBLY INSTRUCTIONS

STEPPING MOTOR DRIVE CIRCUIT()

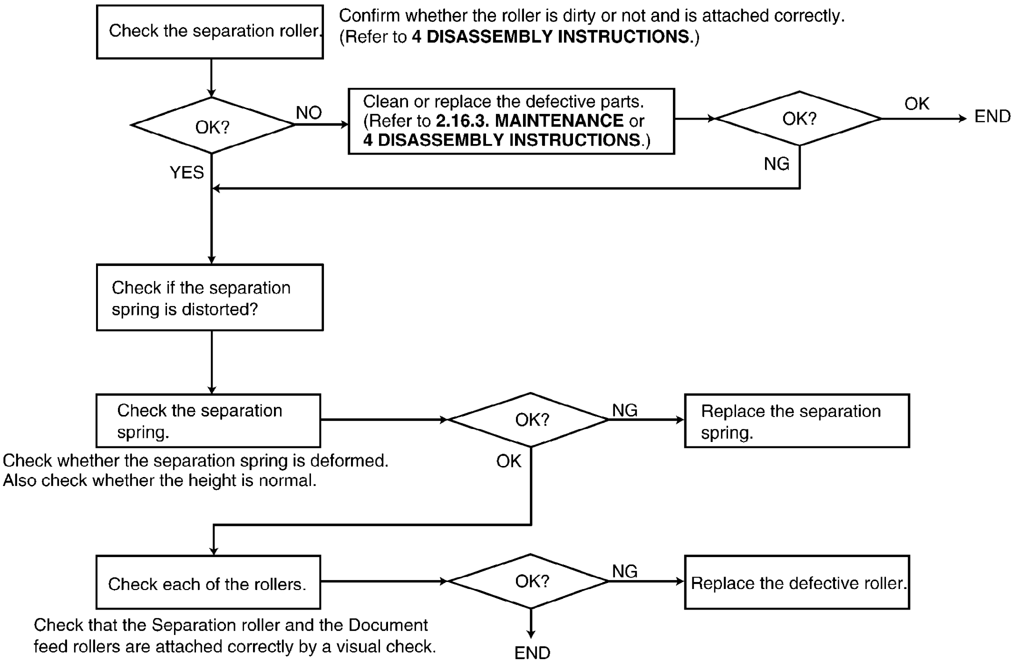
3.3.4.2. DOCUMENT JAM


Open the lid and check the feed route.
Check the paper jam for cause.
OK?
NO
YES
Clean or replace the defective parts.
OK?
OK
END
NG
Clean each roller. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
OK?
OK
END
NG
Check each sensor's movement.
Confirm if the tip of the read position sensor lever works smoothly. [Use the sensor test function (Refer to 3.5. TEST FUNCTIONS).]
OK?
NO
YES
Repair or replace the sensor lever.
OK?
OK
END
NG
Go to 3.3.10. SENSOR SECTION.
Check if the sensor reacts while the flag is moving.
Check each roller's mount.
Check if the separation, feed rollers are attached correctly.
OK?
NO
YES
Repair the defective parts.
OK?
OK
END
NG
END

CROSS REFERENCE:
SENSOR SECTION()
DISASSEMBLY INSTRUCTIONS()

3.3.4.3. MULTIPLE FEED

- When using thick paper etc., sometimes the document will not be fed.

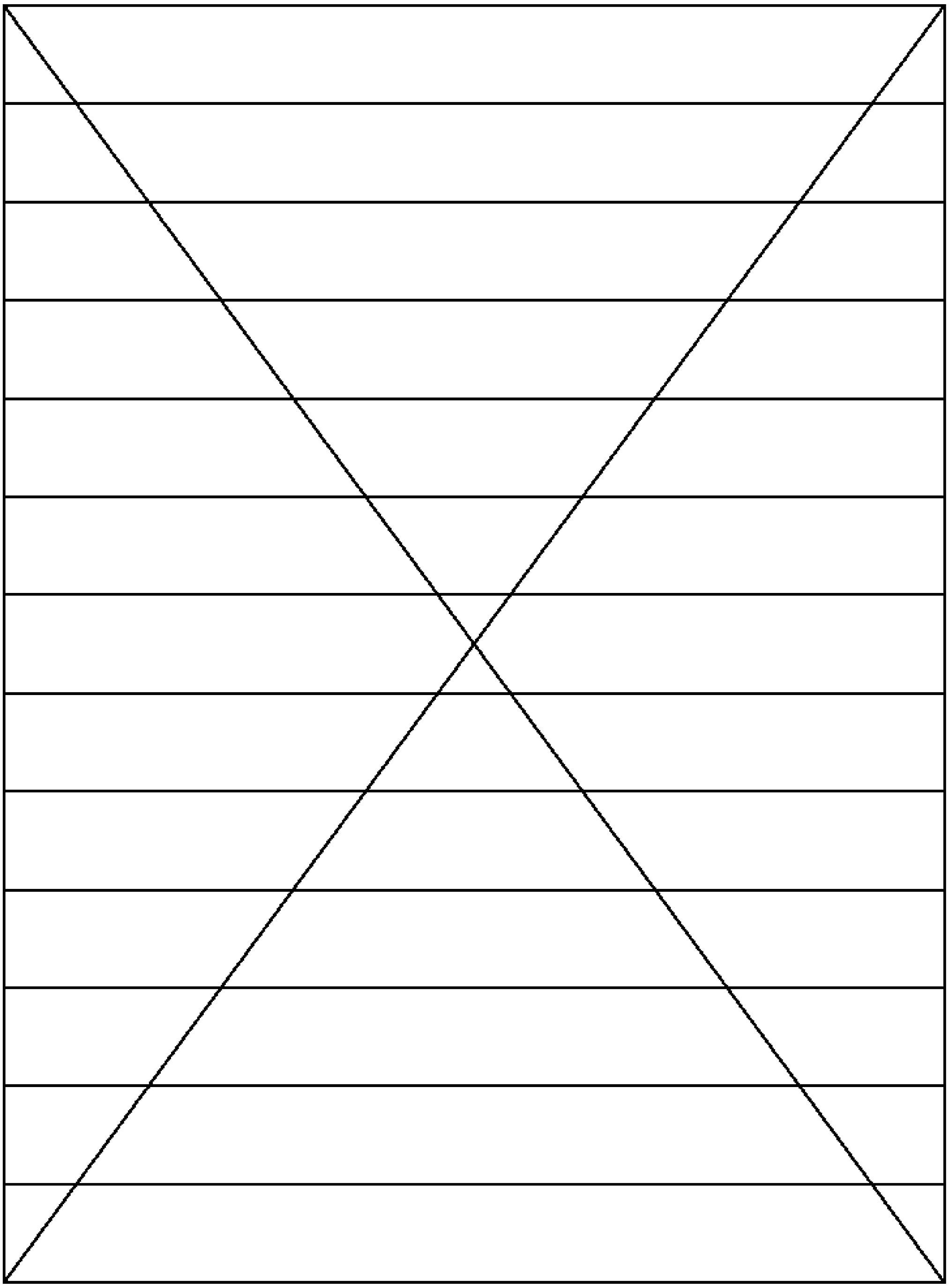

Check the separation roller.
OK?
NO
YES
Clean or replace the defective parts. (Refer to **2.16.3. MAINTENANCE** or **4 DISASSEMBLY INSTRUCTIONS**.)
OK?
OK
END
NG
Check if the separation spring is distorted?
Check the separation spring.
OK?
NG
Replace the separation spring.
OK
Check each of the rollers.
OK?
NG
Replace the defective roller.
END

Confirm whether the roller is dirty or not and is attached correctly. (Refer to **4 DISASSEMBLY INSTRUCTIONS**.)

Check whether the separation spring is deformed. Also check whether the height is normal.

Check that the Separation roller and the Document feed rollers are attached correctly by a visual check.

Fig. B

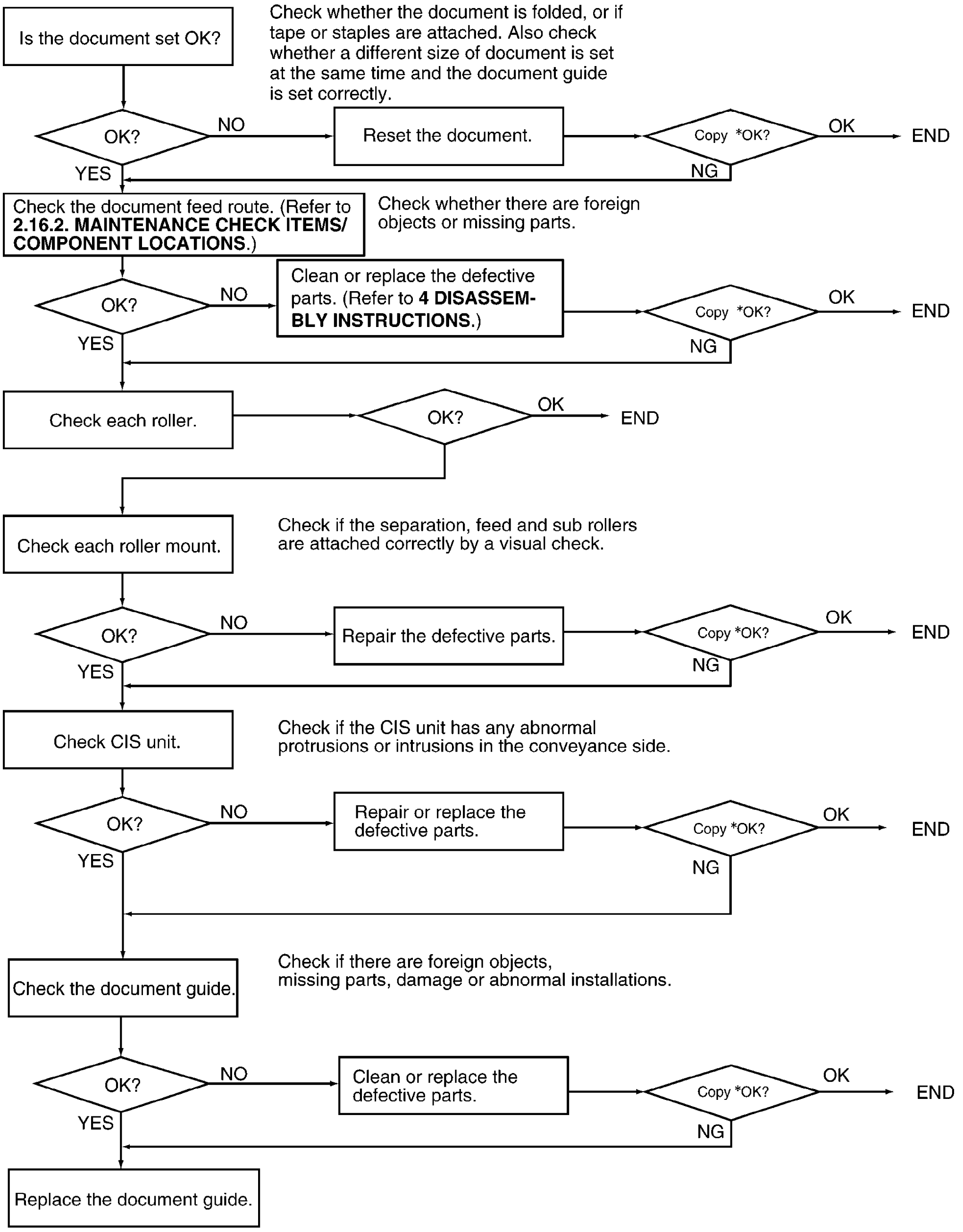


CROSS REFERENCE:
MAINTENANCE()
DISASSEMBLY INSTRUCTIONS()

Note:

When confirming if the characters are extended or distorted, or if the feed problem is occurred, use this test chart format (Fig. B).

3.3.4.4. SKEW


Is the document set OK?
Check whether the document is folded, or if tape or staples are attached. Also check whether a different size of document is set at the same time and the document guide is set correctly.
OK?
NO
YES
Reset the document.
Copy *OK?
OK
END
NG
Check the document feed route. (Refer to **2.16.2. MAINTENANCE CHECK ITEMS/ COMPONENT LOCATIONS**.)
Check whether there are foreign objects or missing parts.
OK?
NO
YES
Clean or replace the defective parts. (Refer to **4 DISASSEMBLY INSTRUCTIONS**.)
Copy *OK?
OK
END
NG
Check each roller.
OK?
OK
END
Check each roller mount.
Check if the separation, feed and sub rollers are attached correctly by a visual check.
OK?
NO
YES
Repair the defective parts.
Copy *OK?
OK
END
NG
Check CIS unit.
Check if the CIS unit has any abnormal protrusions or intrusions in the conveyance side.
OK?
NO
YES
Repair or replace the defective parts.
Copy *OK?
OK
END
NG
Check the document guide.
Check if there are foreign objects, missing parts, damage or abnormal installations.
OK?
NO
YES
Clean or replace the defective parts.
Copy *OK?
OK
END
NG
Replace the document guide.

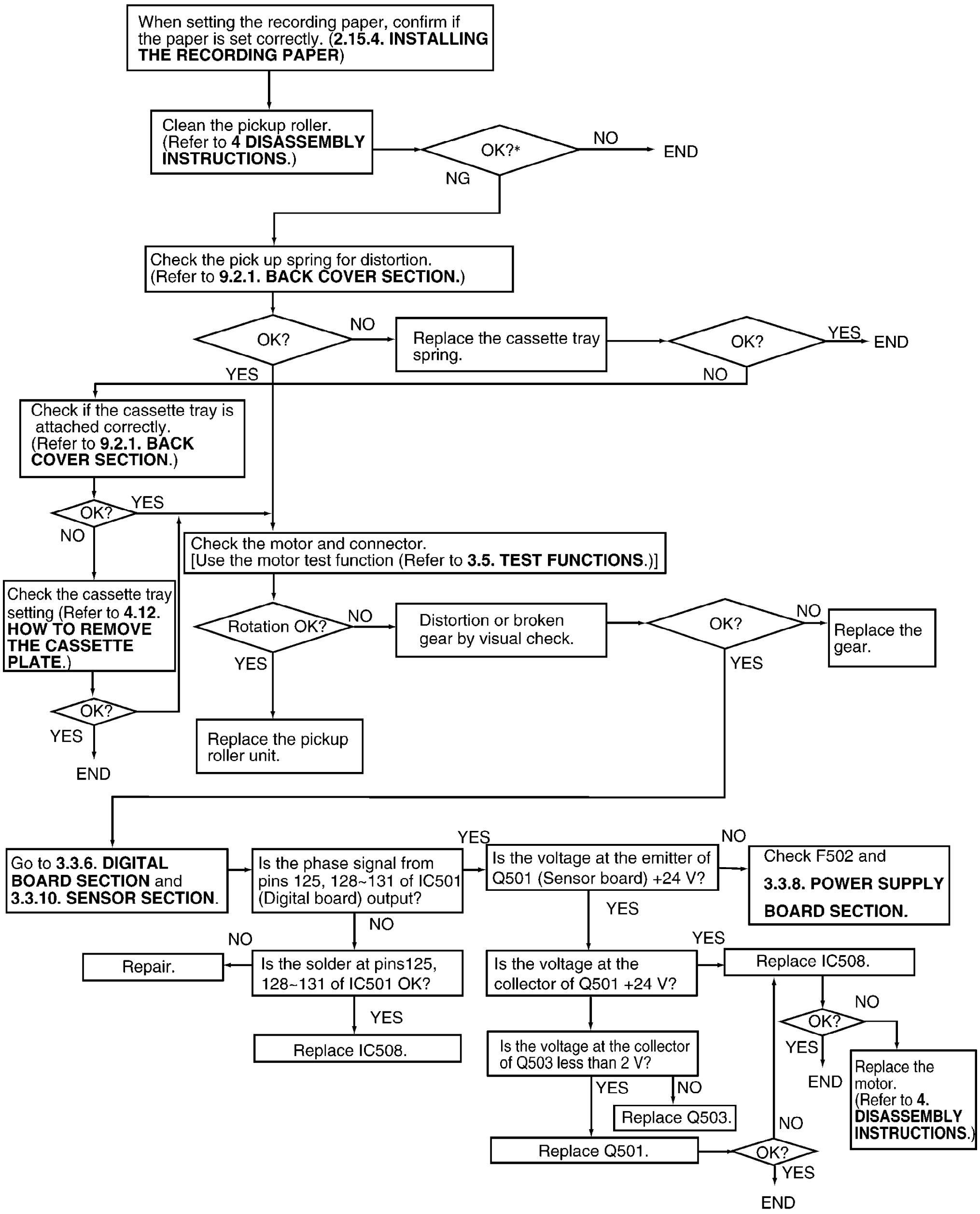
*** We recommend making a copy of the Fig. B document in MULTIPLE FEED () and using it.**

CROSS REFERENCE:

MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS()

DISASSEMBLY INSTRUCTIONS()

3.3.4.5. THE RECORDING PAPER DOES NOT FEED


When setting the recording paper, confirm if the paper is set correctly. (2.15.4. INSTALLING THE RECORDING PAPER)
Clean the pickup roller. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
OK?*
NO
END
NG
Check the pick up spring for distortion. (Refer to 9.2.1. BACK COVER SECTION.)
OK?
NO
Replace the cassette tray spring.
OK?
YES
END
YES
NO
Check if the cassette tray is attached correctly. (Refer to 9.2.1. BACK COVER SECTION.)
OK?
YES
NO
Check the motor and connector. [Use the motor test function (Refer to 3.5. TEST FUNCTIONS.)]
Check the cassette tray setting (Refer to 4.12. HOW TO REMOVE THE CASSETTE PLATE.)
Rotation OK?
NO
Distortion or broken gear by visual check.
OK?
NO
Replace the gear.
YES
YES
OK?
YES
END
Replace the pickup roller unit.
Go to 3.3.6. DIGITAL BOARD SECTION and 3.3.10. SENSOR SECTION.
Is the phase signal from pins 125, 128~131 of IC501 (Digital board) output?
YES
Is the voltage at the emitter of Q501 (Sensor board) +24 V?
NO
Check F502 and 3.3.8. POWER SUPPLY BOARD SECTION.
NO
YES
NO
Repair.
Is the solder at pins125, 128~131 of IC501 OK?
Is the voltage at the collector of Q501 +24 V?
YES
Replace IC508.
NO
OK?
YES
YES
END
Replace IC508.
Is the voltage at the collector of Q503 less than 2 V?
Replace the motor. (Refer to 4. DISASSEMBLY INSTRUCTIONS.)
YES
NO
Replace Q503.
NO
Replace Q501.
OK?
YES
END

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED ()and using it.**

CROSS REFERENCE:

INSTALLING THE RECORDING PAPER()

DIGITAL BOARD SECTION()

POWER SUPPLY BOARD SECTION()

SENSOR SECTION()

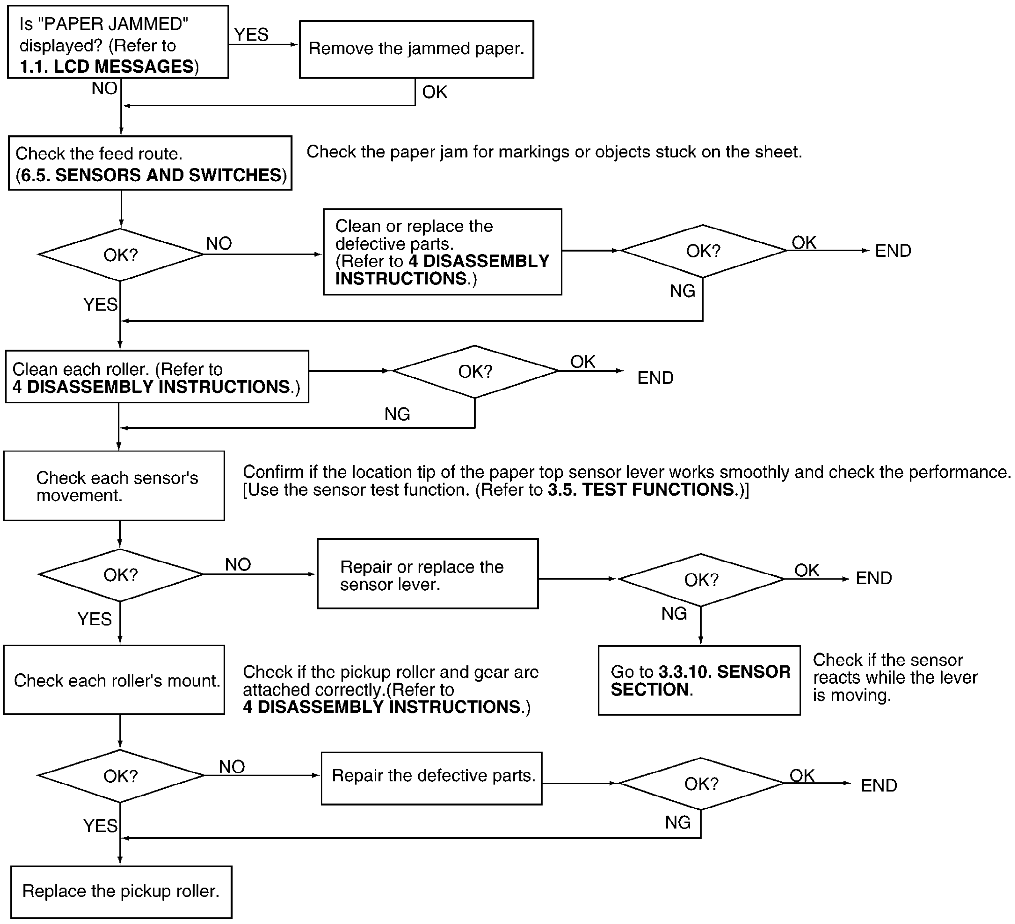
TEST FUNCTIONS()

DISASSEMBLY INSTRUCTIONS()

HOW TO REMOVE THE CASSETTE TRAY()

BACK COVER SECTION()

3.3.4.6. PAPER JAM


Is "PAPER JAMMED" displayed? (Refer to 1.1. LCD MESSAGES)
YES
Remove the jammed paper.
NO
OK
Check the feed route. (6.5. SENSORS AND SWITCHES)
Check the paper jam for markings or objects stuck on the sheet.
OK?
NO
Clean or replace the defective parts. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
OK?
OK
END
NG
YES
Clean each roller. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
OK?
OK
END
NG
Check each sensor's movement.
Confirm if the location tip of the paper top sensor lever works smoothly and check the performance. [Use the sensor test function. (Refer to 3.5. TEST FUNCTIONS.)]
OK?
NO
Repair or replace the sensor lever.
OK?
OK
END
NG
YES
Check each roller's mount.
Check if the pickup roller and gear are attached correctly.(Refer to 4 DISASSEMBLY INSTRUCTIONS.)
Go to 3.3.10. SENSOR SECTION.
Check if the sensor reacts while the lever is moving.
OK?
NO
Repair the defective parts.
OK?
OK
END
NG
YES
Replace the pickup roller.

CROSS REFERENCE:

LCD MESSAGES()

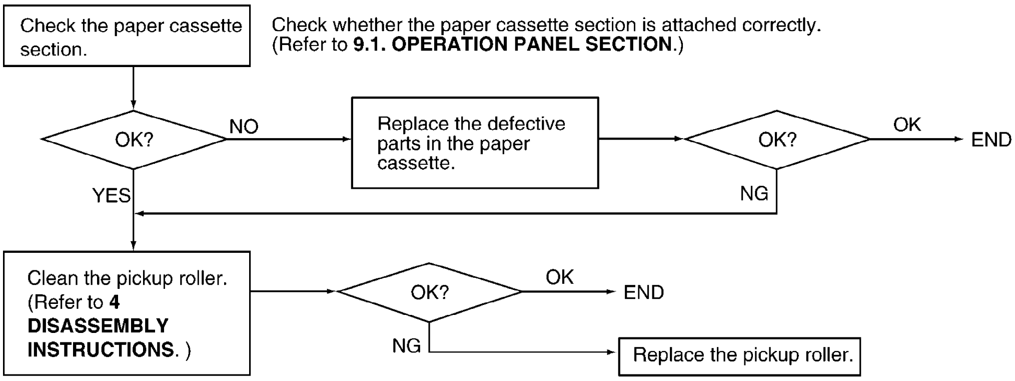
SENSOR SECTION()

TEST FUNCTIONS()

DISASSEMBLY INSTRUCTIONS()

SENSORS AND SWITCHES()

3.3.4.7. MULTIPLE FEED AND SKEW

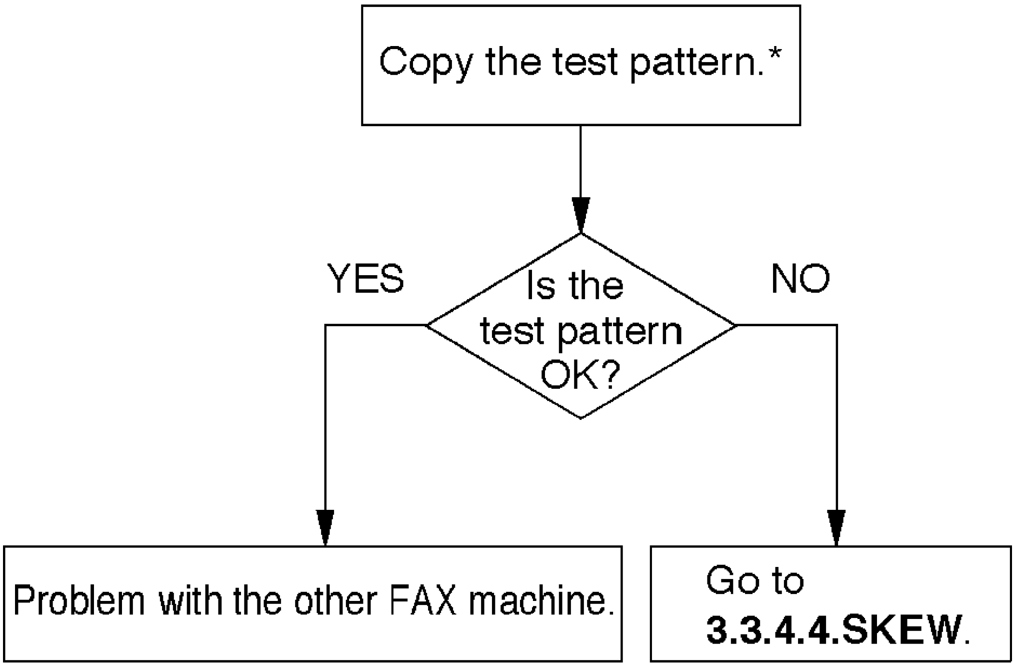

Check the paper cassette section.
Check whether the paper cassette section is attached correctly. (Refer to 9.1. OPERATION PANEL SECTION.)
OK?
NO
Replace the defective parts in the paper cassette.
OK?
OK
END
NG
YES
Clean the pickup roller. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
OK?
OK
END
NG
Replace the pickup roller.

CROSS REFERENCE:

DISASSEMBLY INSTRUCTIONS()

OPERATION PANEL SECTION()

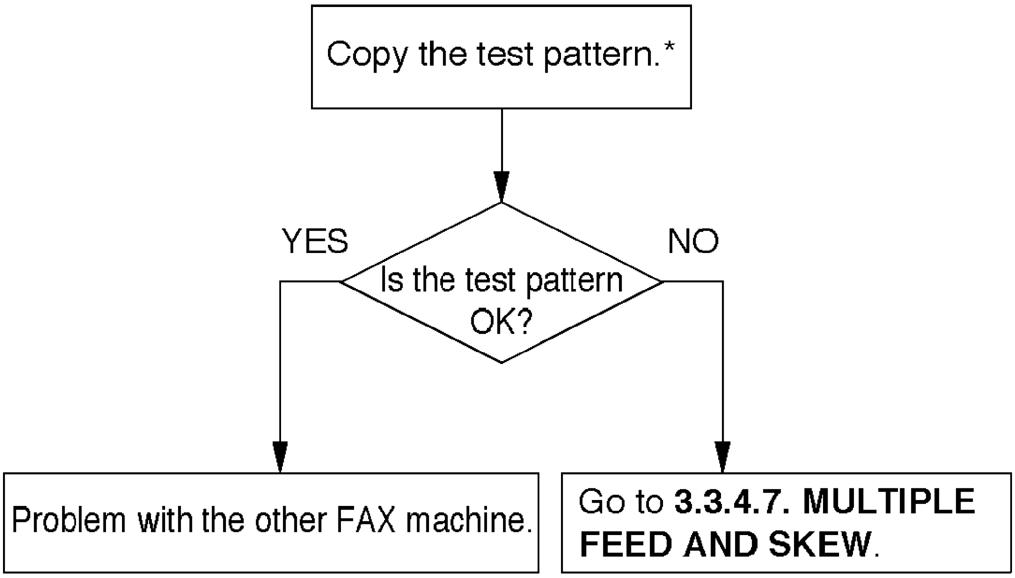
3.3.4.8. THE SENT FAX DATA IS SKEWED


Copy the test pattern.*
YES
Is the test pattern OK?
NO
Problem with the other FAX machine.
Go to 3.3.4.4.SKEW.

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED() and using it.**

CROSS REFERENCE:
SKEW()

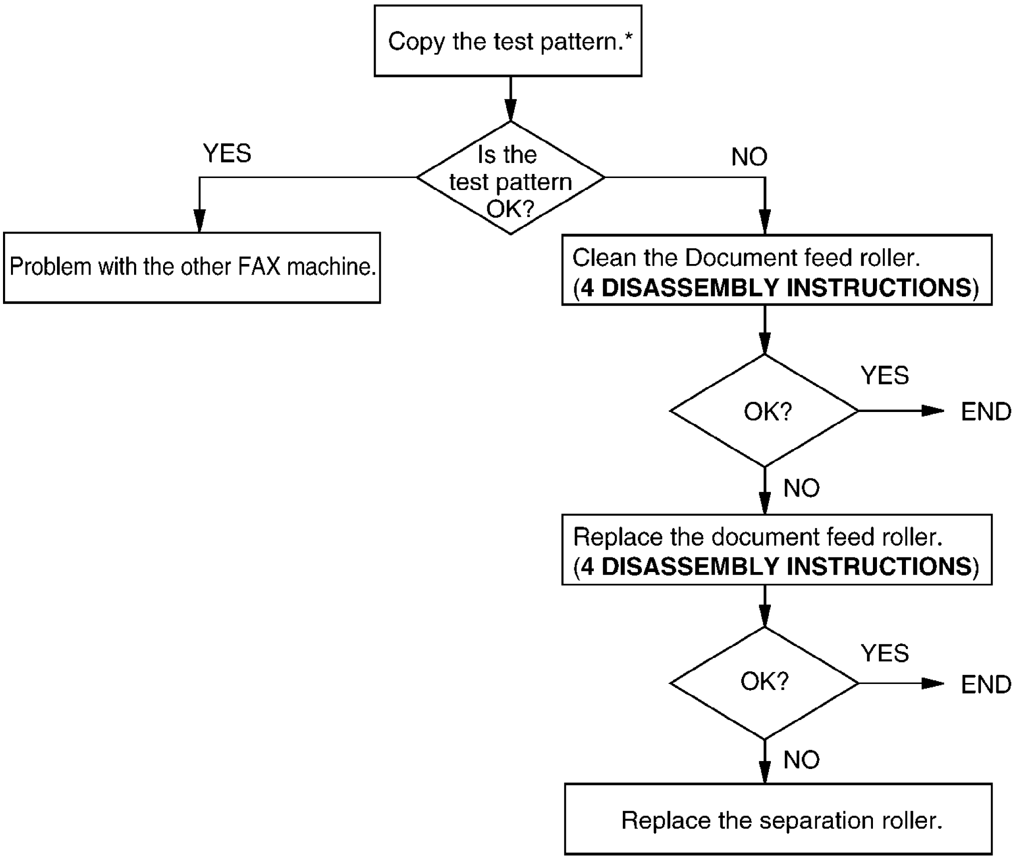
3.3.4.9. THE RECEIVED FAX DATA IS SKEWED


Copy the test pattern.*
YES
Is the test pattern OK?
NO
Problem with the other FAX machine.
Go to 3.3.4.7. MULTIPLE FEED AND SKEW.

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED() and using it.**

CROSS REFERENCE:
MULTIPLE FEED AND SKEW()

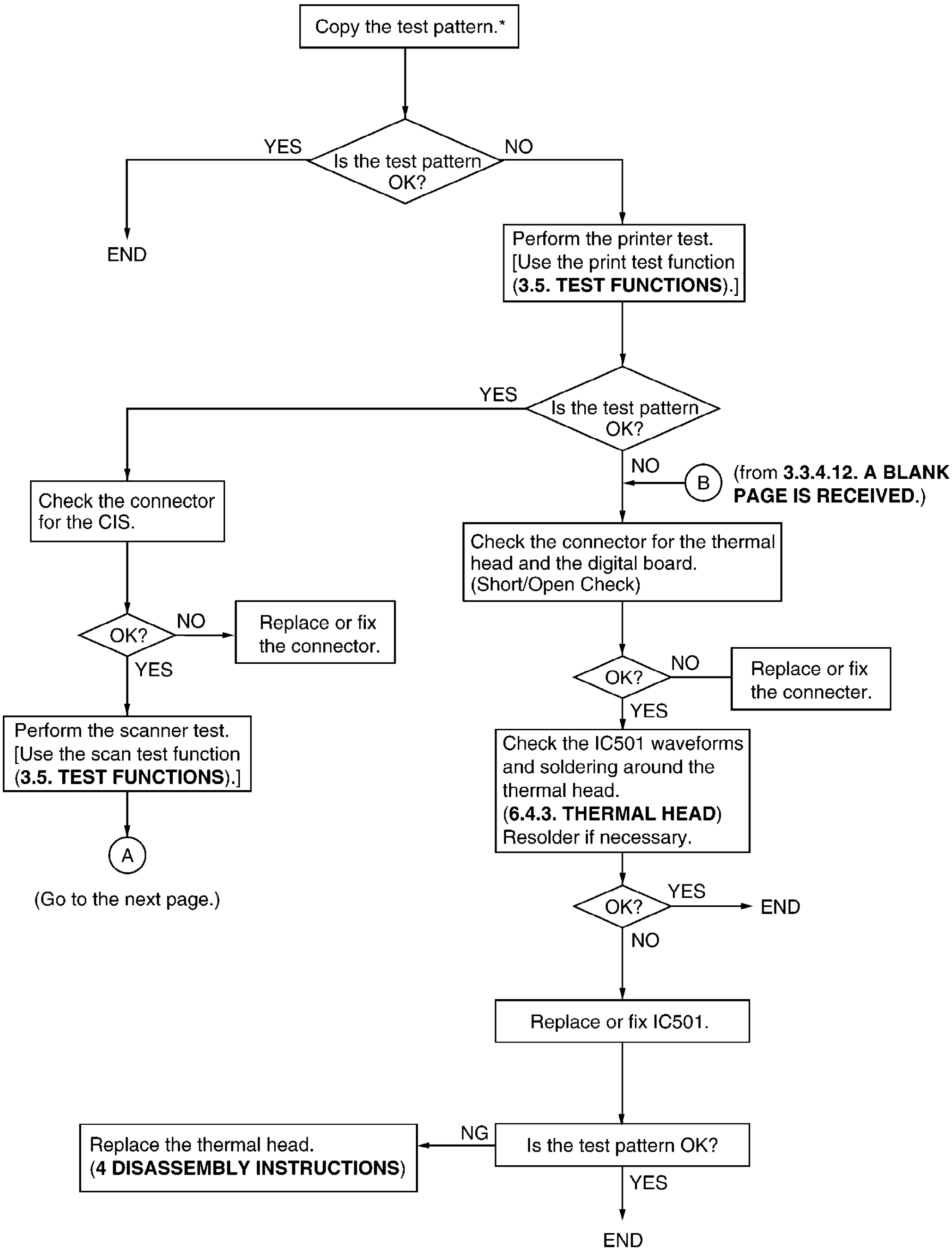
3.3.4.10. RECEIVED OR COPIED DATA IS EXPANDED


Copy the test pattern.*
Is the test pattern OK?
YES
NO
Problem with the other FAX machine.
Clean the Document feed roller. (4 DISASSEMBLY INSTRUCTIONS)
OK?
YES
END
NO
Replace the document feed roller. (4 DISASSEMBLY INSTRUCTIONS)
OK?
YES
END
NO
Replace the separation roller.

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED() and using it.**

CROSS REFERENCE:
DISASSEMBLY INSTRUCTIONS()

3.3.4.11. A BLANK PAGE IS COPIED


Copy the test pattern.*
Is the test pattern OK?
YES
NO
END
Perform the printer test. [Use the print test function (3.5. TEST FUNCTIONS).]
Is the test pattern OK?
YES
NO
B
(from 3.3.4.12. A BLANK PAGE IS RECEIVED.)
Check the connector for the CIS.
OK?
NO
YES
Replace or fix the connector.
Perform the scanner test. [Use the scan test function (3.5. TEST FUNCTIONS).]
A
(Go to the next page.)
Check the connector for the thermal head and the digital board. (Short/Open Check)
OK?
NO
YES
Replace or fix the connecter.
Check the IC501 waveforms and soldering around the thermal head. (6.4.3. THERMAL HEAD) Resolder if necessary.
OK?
YES
END
NO
Replace or fix IC501.
Is the test pattern OK?
NG
Replace the thermal head. (4 DISASSEMBLY INSTRUCTIONS)
YES
END

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED () and using it.**

CROSS REFERENCE:

A BLANK PAGE IS RECEIVED()
TEST FUNCTIONS()
DISASSEMBLY INSTRUCTIONS()
THERMAL HEAD()

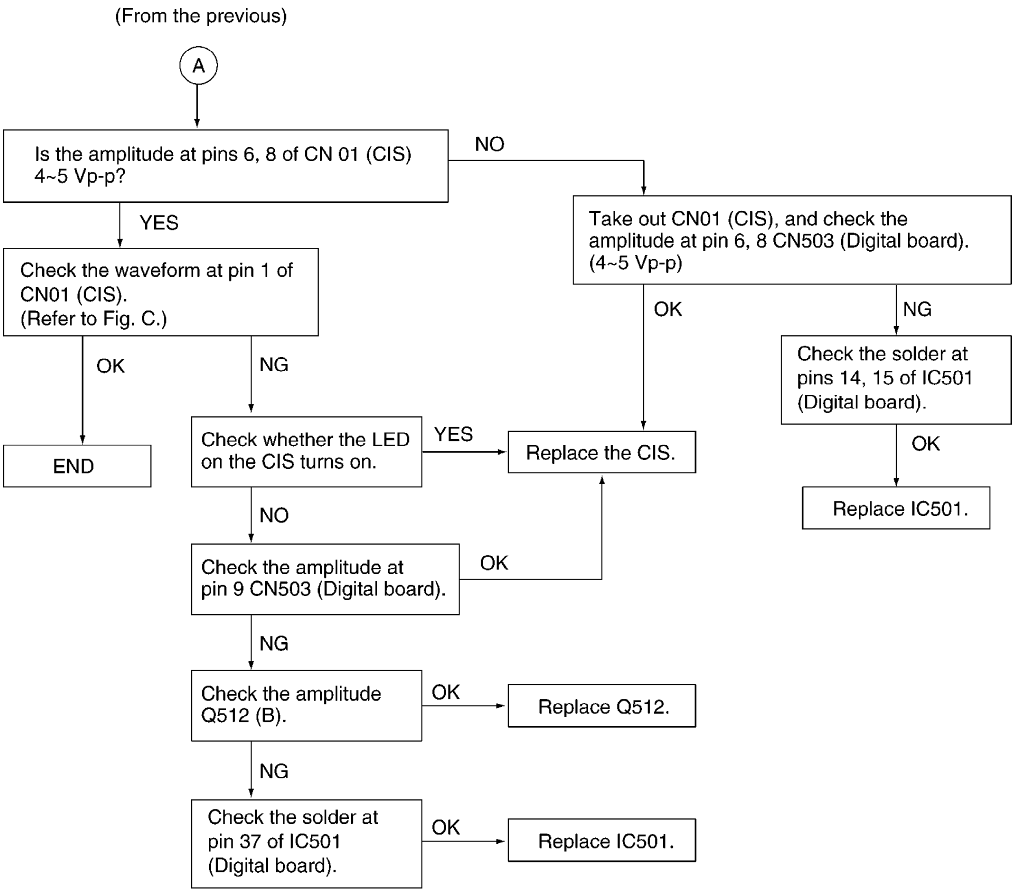
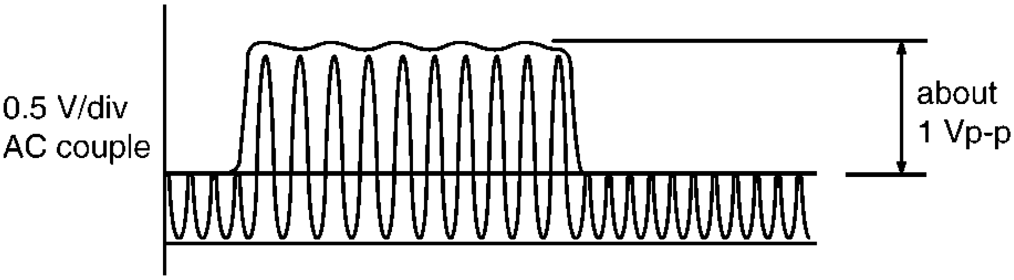
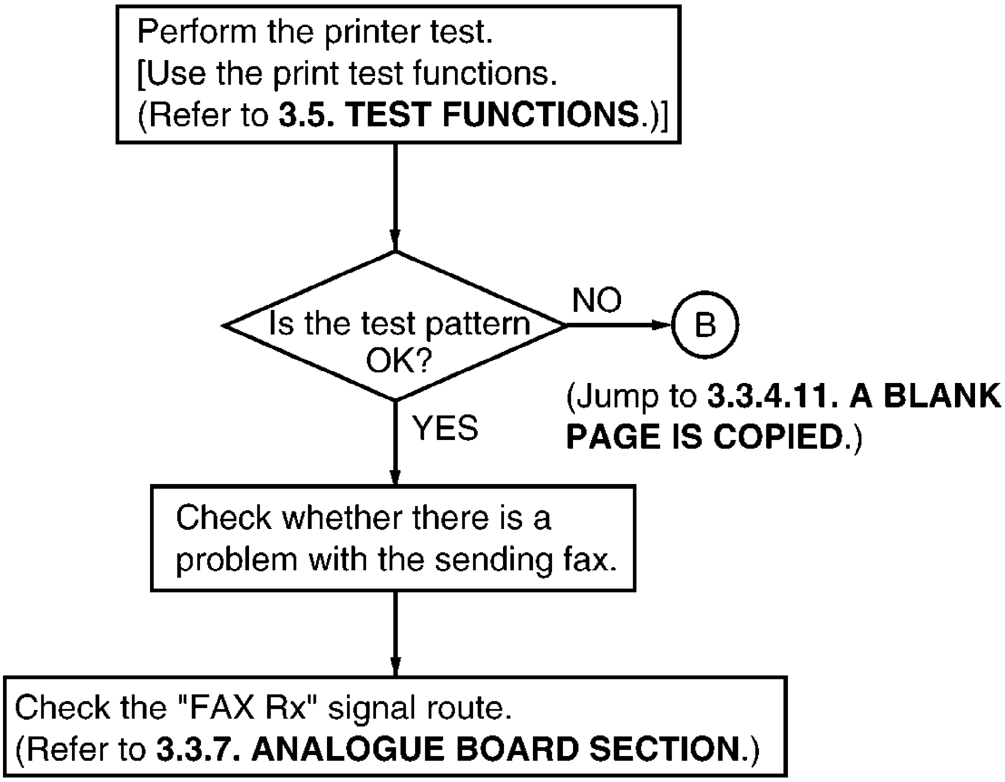

(From the previous)
A
Is the amplitude at pins 6, 8 of CN 01 (CIS) 4~5 Vp-p?
NO
YES
Take out CN01 (CIS), and check the amplitude at pin 6, 8 CN503 (Digital board). (4~5 Vp-p)
Check the waveform at pin 1 of CN01 (CIS). (Refer to Fig. C.)
OK
NG
OK
NG
Check the solder at pins 14, 15 of IC501 (Digital board).
END
Check whether the LED on the CIS turns on.
YES
Replace the CIS.
OK
Replace IC501.
NO
Check the amplitude at pin 9 CN503 (Digital board).
OK
NG
Check the amplitude Q512 (B).
OK
Replace Q512.
NG
Check the solder at pin 37 of IC501 (Digital board).
OK
Replace IC501.

Fig. C



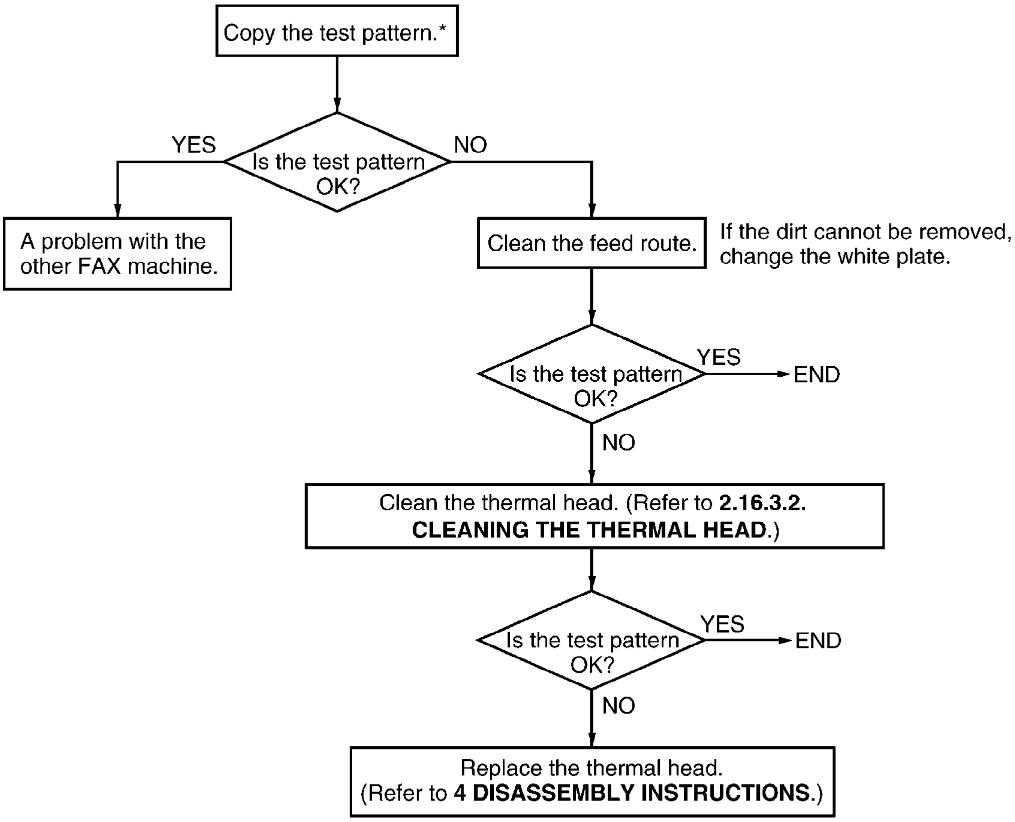
3.3.4.12. A BLANK PAGE IS RECEIVED


Perform the printer test.
[Use the print test functions.
(Refer to **3.5. TEST FUNCTIONS**.)]
Is the test pattern OK?
NO
B
(Jump to **3.3.4.11. A BLANK PAGE IS COPIED**.)
YES
Check whether there is a problem with the sending fax.
Check the "FAX Rx" signal route.
(Refer to **3.3.7. ANALOGUE BOARD SECTION**.)

CROSS REFERENCE:

A BLANK PAGE IS COPIED()
ANALOGUE BOARD SECTION()
TEST FUNCTIONS()

3.3.4.13. BLACK OR WHITE VERTICAL LINE


Copy the test pattern.*
Is the test pattern OK?
YES
NO
A problem with the other FAX machine.
Clean the feed route.
If the dirt cannot be removed, change the white plate.
Is the test pattern OK?
YES
END
NO
Clean the thermal head. (Refer to 2.16.3.2. CLEANING THE THERMAL HEAD.)
Is the test pattern OK?
YES
END
NO
Replace the thermal head. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)

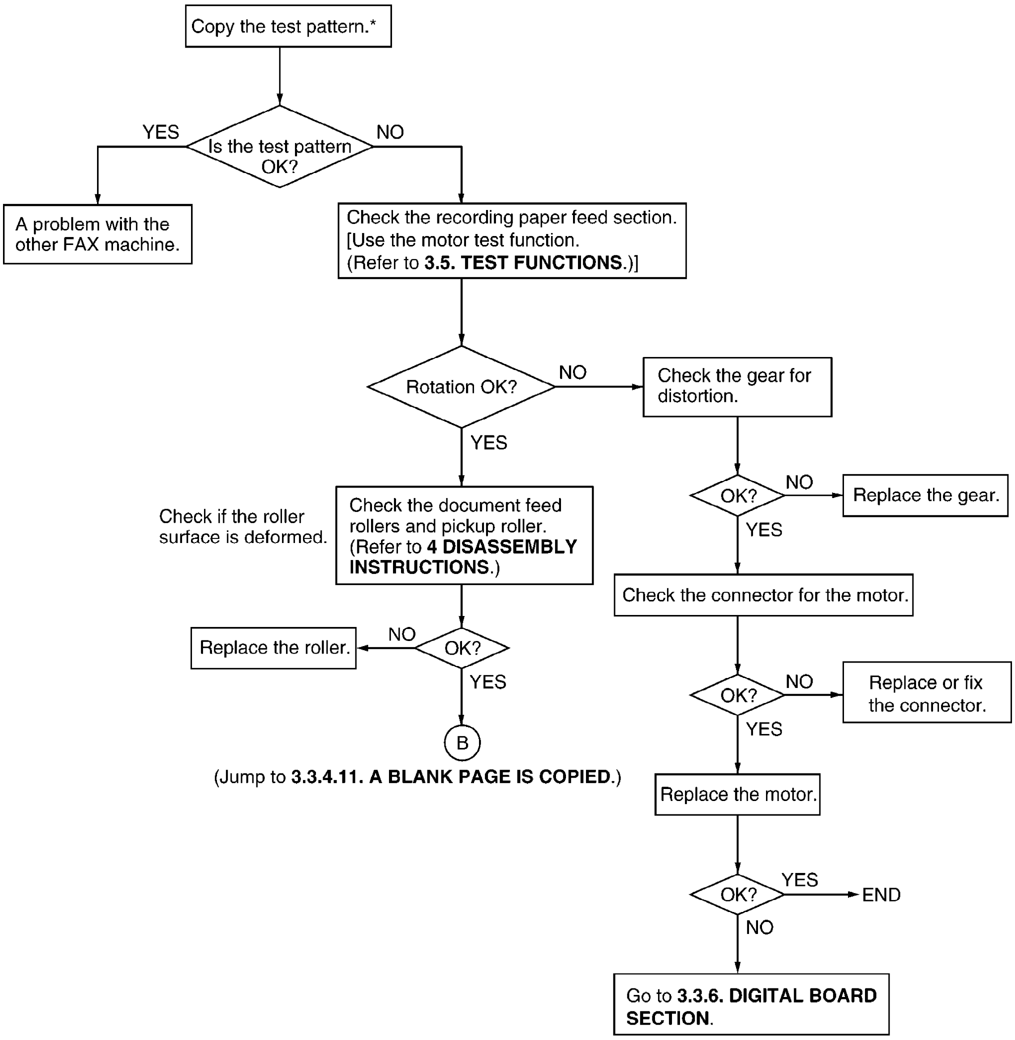
*** We recommend making a copy of the Fig. B document in MULTIPLE FEED () and using it.**

CROSS REFERENCE:

CLEANING THE THERMAL HEAD AND BLACK BAR()

DISASSEMBLY INSTRUCTIONS()

3.3.4.14. BLACK OR WHITE LATERAL LINE ON PRINT OUT


Copy the test pattern.*
Is the test pattern OK?
YES
NO
A problem with the other FAX machine.
Check the recording paper feed section. [Use the motor test function. (Refer to 3.5. TEST FUNCTIONS.)]
Rotation OK?
NO
Check the gear for distortion.
YES
OK?
NO
Replace the gear.
YES
Check if the roller surface is deformed.
Check the document feed rollers and pickup roller. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
Check the connector for the motor.
Replace the roller.
NO
OK?
YES
OK?
NO
Replace or fix the connector.
YES
B
(Jump to 3.3.4.11. A BLANK PAGE IS COPIED.)
Replace the motor.
OK?
YES
END
NO
Go to 3.3.6. DIGITAL BOARD SECTION.

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED() and using it.**

CROSS REFERENCE:

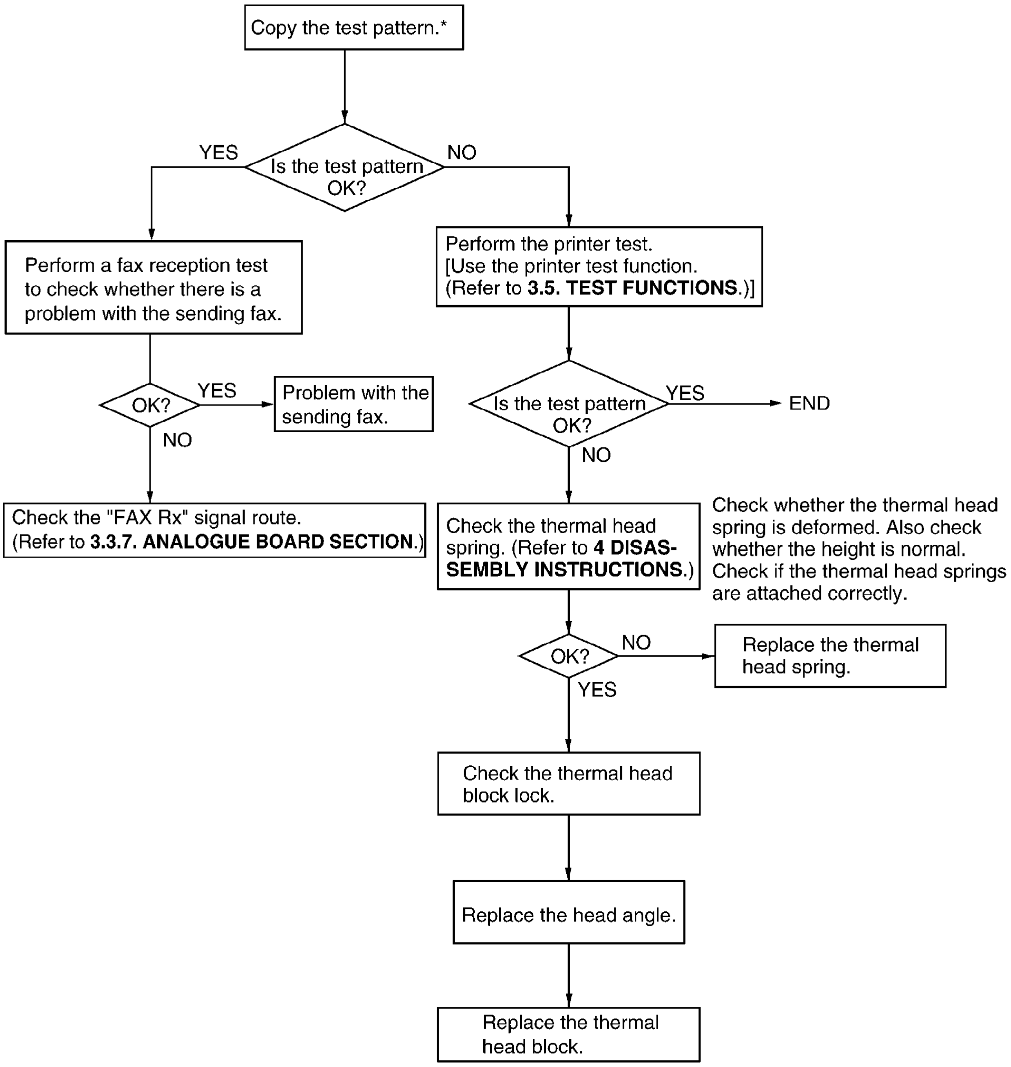
A BLANK PAGE IS COPIED()

DIGITAL BOARD SECTION()

TEST FUNCTIONS()

DISASSEMBLY INSTRUCTIONS()

3.3.4.15. AN ABNORMAL IMAGE IS PRINTED


Copy the test pattern.*
Is the test pattern OK?
YES
NO
Perform a fax reception test to check whether there is a problem with the sending fax.
Perform the printer test. [Use the printer test function. (Refer to 3.5. TEST FUNCTIONS.)]
OK?
YES
NO
Problem with the sending fax.
Is the test pattern OK?
YES
END
NO
Check the "FAX Rx" signal route. (Refer to 3.3.7. ANALOGUE BOARD SECTION.)
Check the thermal head spring. (Refer to 4 DISASSEMBLY INSTRUCTIONS.)
Check whether the thermal head spring is deformed. Also check whether the height is normal. Check if the thermal head springs are attached correctly.
OK?
NO
YES
Replace the thermal head spring.
Check the thermal head block lock.
Replace the head angle.
Replace the thermal head block.

*** We recommend making a copy of the Fig. B document in MULTIPLE FEED () and using it.**

CROSS REFERENCE:
ANALOGUE BOARD SECTION()
TEST FUNCTIONS()
DISASSEMBLY INSTRUCTIONS()

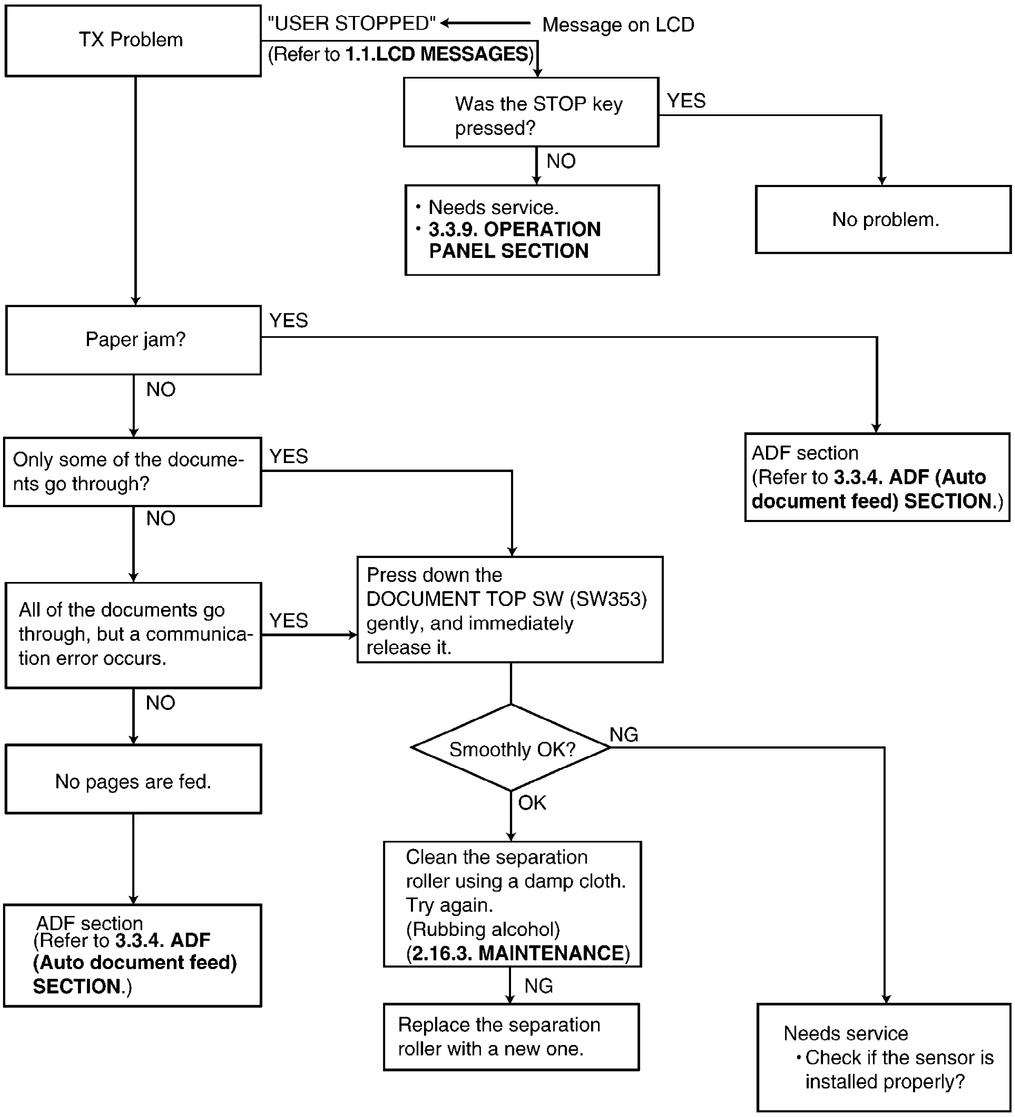
3.3.5. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in DEFECTIVE FACSIMILE SECTION().

No.	Symptom	Content	Possible cause
1	The paper is not fed properly when faxing. (Nor in the copy mode.)	Troubleshooting	Problem with the feeding mechanism.
2	The fax usually transmits successfully but sometimes fails. (The unit can copy documents.)	Troubleshooting	Problem with the service line or with the receiver's fax.
3	The fax usually receives successfully but sometimes fails. (The unit can copy documents.)	Troubleshooting	Problem with the service line or with the transmitter's fax.
4	The fax completely fails to transmit or receive. (The unit can copy documents.)	Troubleshooting	Problem with the electric circuit.
5	The fax fails either to transmit or receive when making a long distance or an international call. (The unit can copy documents.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	The fax image is poor when transmitting or receiving during a long distance or an international call.		
7	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	

3.3.5.1. DEFECTIVE FACSIMILE SECTION

3.3.5.1.1. TRANSMIT PROBLEM


TX Problem
"USER STOPPED"
Message on LCD
(Refer to 1.1.LCD MESSAGES)
Was the STOP key pressed?
YES
NO
• Needs service.
• 3.3.9. OPERATION PANEL SECTION
No problem.
Paper jam?
YES
NO
ADF section (Refer to 3.3.4. ADF (Auto document feed) SECTION.)
Only some of the documents go through?
YES
NO
Press down the DOCUMENT TOP SW (SW353) gently, and immediately release it.
All of the documents go through, but a communication error occurs.
YES
NO
Smoothly OK?
NG
OK
No pages are fed.
Clean the separation roller using a damp cloth. Try again. (Rubbing alcohol) (2.16.3. MAINTENANCE)
NG
ADF section (Refer to 3.3.4. ADF (Auto document feed) SECTION.)
Replace the separation roller with a new one.
Needs service
• Check if the sensor is installed properly?

CROSS REFERENCE:

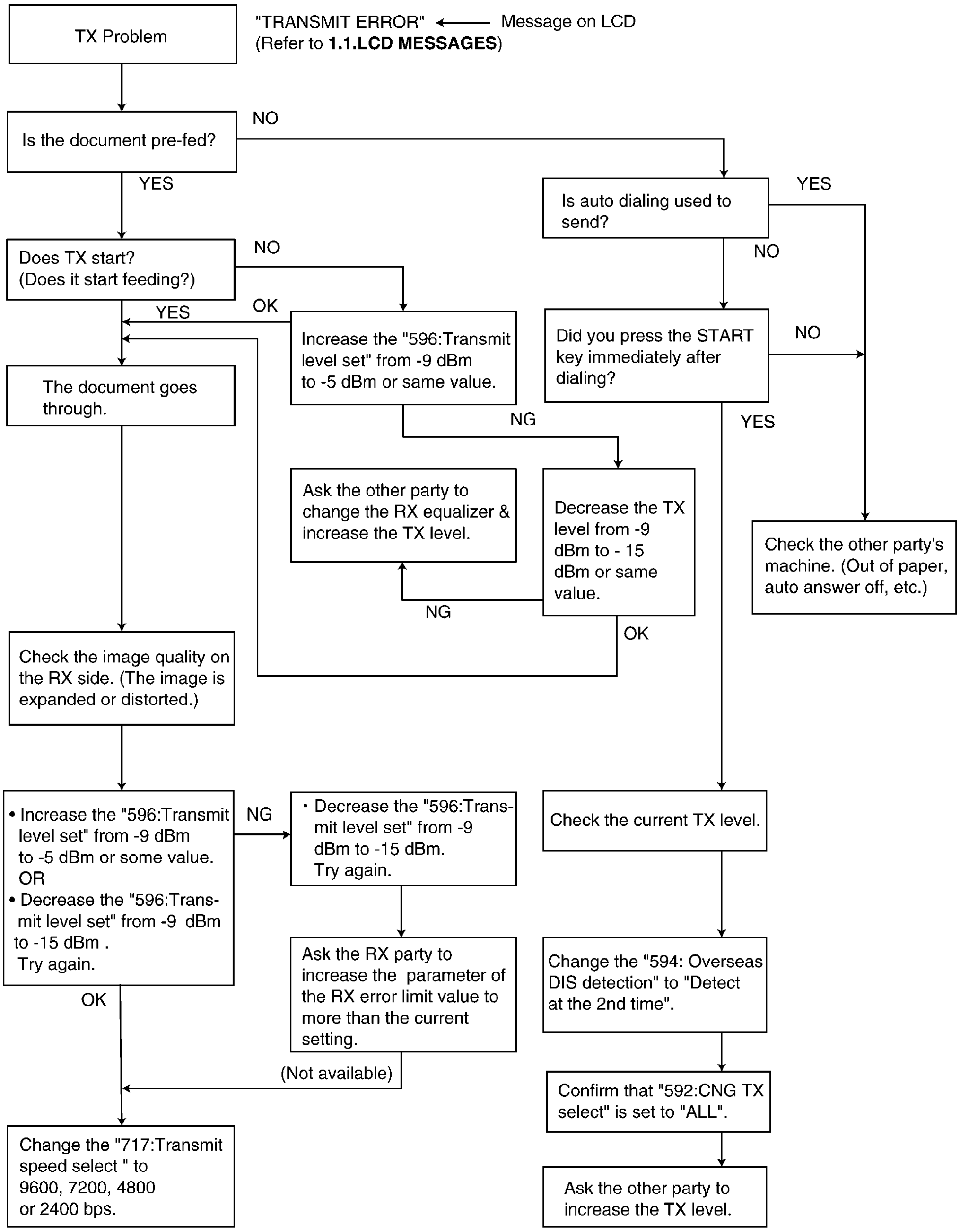
LCD MESSAGES()

MAINTENANCE()

ADF (Auto Document Feed) SECTION()

OPERATION PANEL SECTION()

3.3.5.1.2. SOMETIME THERE IS A TRANSMIT PROBLEM


TX Problem
"TRANSMIT ERROR" ← Message on LCD
(Refer to **1.1.LCD MESSAGES**)
Is the document pre-fed?
NO
YES
Is auto dialing used to send?
YES
NO
Does TX start? (Does it start feeding?)
NO
YES
OK
Increase the "596:Transmit level set" from -9 dBm to -5 dBm or same value.
Did you press the START key immediately after dialing?
NO
YES
The document goes through.
NG
Ask the other party to change the RX equalizer & increase the TX level.
Decrease the TX level from -9 dBm to - 15 dBm or same value.
Check the other party's machine. (Out of paper, auto answer off, etc.)
NG
OK
Check the image quality on the RX side. (The image is expanded or distorted.)
• Increase the "596:Transmit level set" from -9 dBm to -5 dBm or some value. OR • Decrease the "596:Transmit level set" from -9 dBm to -15 dBm . Try again.
NG
• Decrease the "596:Transmit level set" from -9 dBm to -15 dBm. Try again.
Check the current TX level.
OK
Ask the RX party to increase the parameter of the RX error limit value to more than the current setting.
Change the "594: Overseas DIS detection" to "Detect at the 2nd time".
(Not available)
Confirm that "592:CNG TX select" is set to "ALL".
Change the "717:Transmit speed select " to 9600, 7200, 4800 or 2400 bps.
Ask the other party to increase the TX level.

Note:

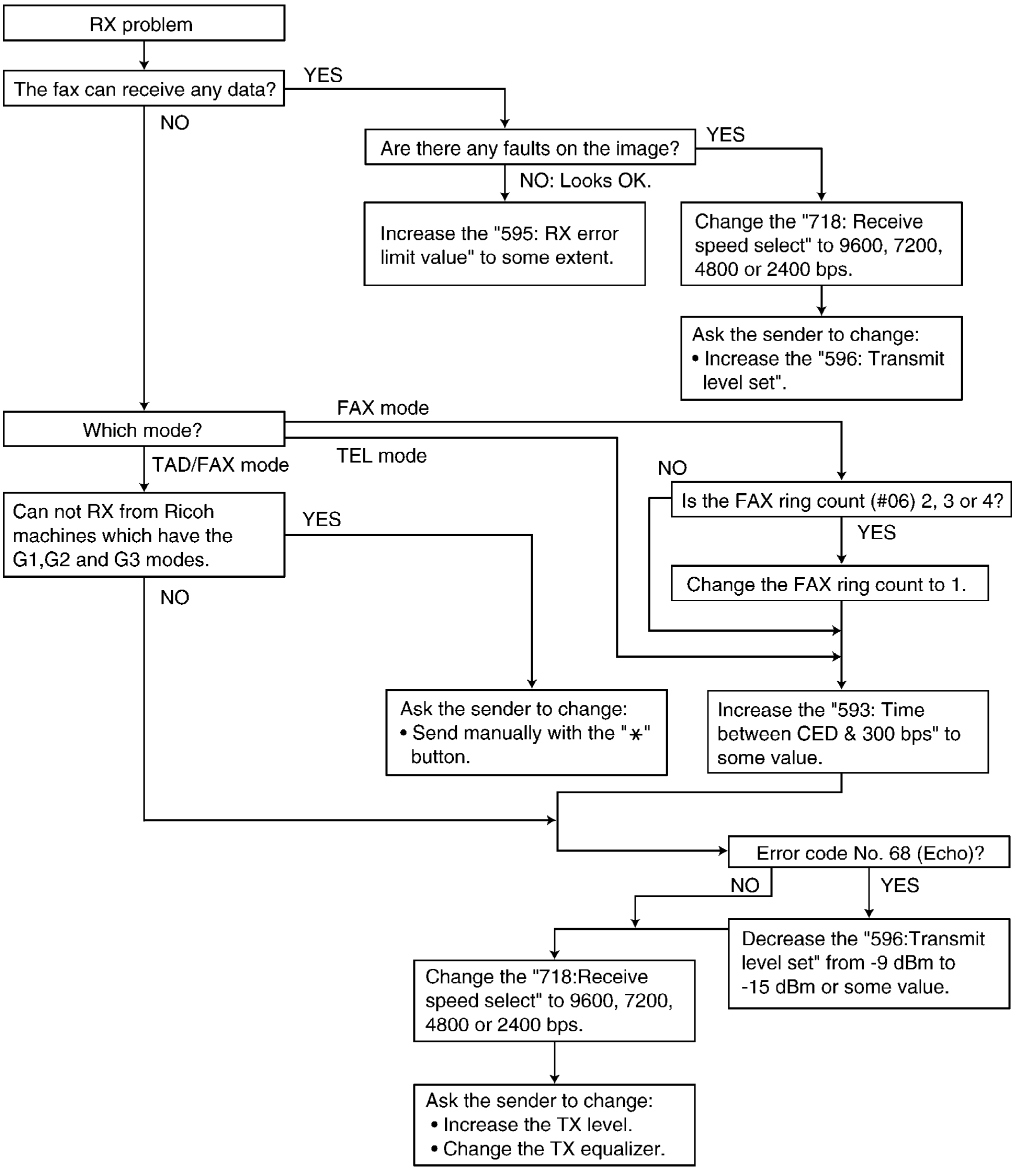
"596: Transmit level set" represents a service code. (Refer to SERVICE FUNCTION TABLE().)

CROSS REFERENCE:

LCD MESSAGES()

3.3.5.1.3. RECEIVE PROBLEM

First confirm whether the recording paper is installed properly or not before starting troubleshooting. (Refer to "Remarks".)


RX problem
The fax can receive any data?
YES
NO
Are there any faults on the image?
YES
NO: Looks OK.
Increase the "595: RX error limit value" to some extent.
Change the "718: Receive speed select" to 9600, 7200, 4800 or 2400 bps.
Ask the sender to change:
• Increase the "596: Transmit level set".
Which mode?
FAX mode
TEL mode
TAD/FAX mode
NO
Is the FAX ring count (#06) 2, 3 or 4?
YES
Change the FAX ring count to 1.
Can not RX from Ricoh machines which have the G1,G2 and G3 modes.
YES
NO
Ask the sender to change:
• Send manually with the "*" button.
Increase the "593: Time between CED & 300 bps" to some value.
Error code No. 68 (Echo)?
NO
YES
Decrease the "596:Transmit level set" from -9 dBm to -15 dBm or some value.
Change the "718:Receive speed select" to 9600, 7200, 4800 or 2400 bps.
Ask the sender to change:
• Increase the TX level.
• Change the TX equalizer.

Note:

"596: Transmit level set" represents a service code. (Refer to SERVICE FUNCTION TABLE().)

Remarks:

Regarding the reception problem, we have investigated the conceivable causes in the flow chart except for the software-related errors. However, some troubles may occur due to the software-related problems such as "OUT OF PAPER" when the fax switches to the memory receiving mode and the memory capacity becomes full of the unprintable data. In this case, error messages [MEMORY FULL] and its main cause, for example "CHECK PAPER" are displayed on the LCD. Once you solve the main problem, [MEMORY FULL] will be cancelled and the reception problem will be resolved.

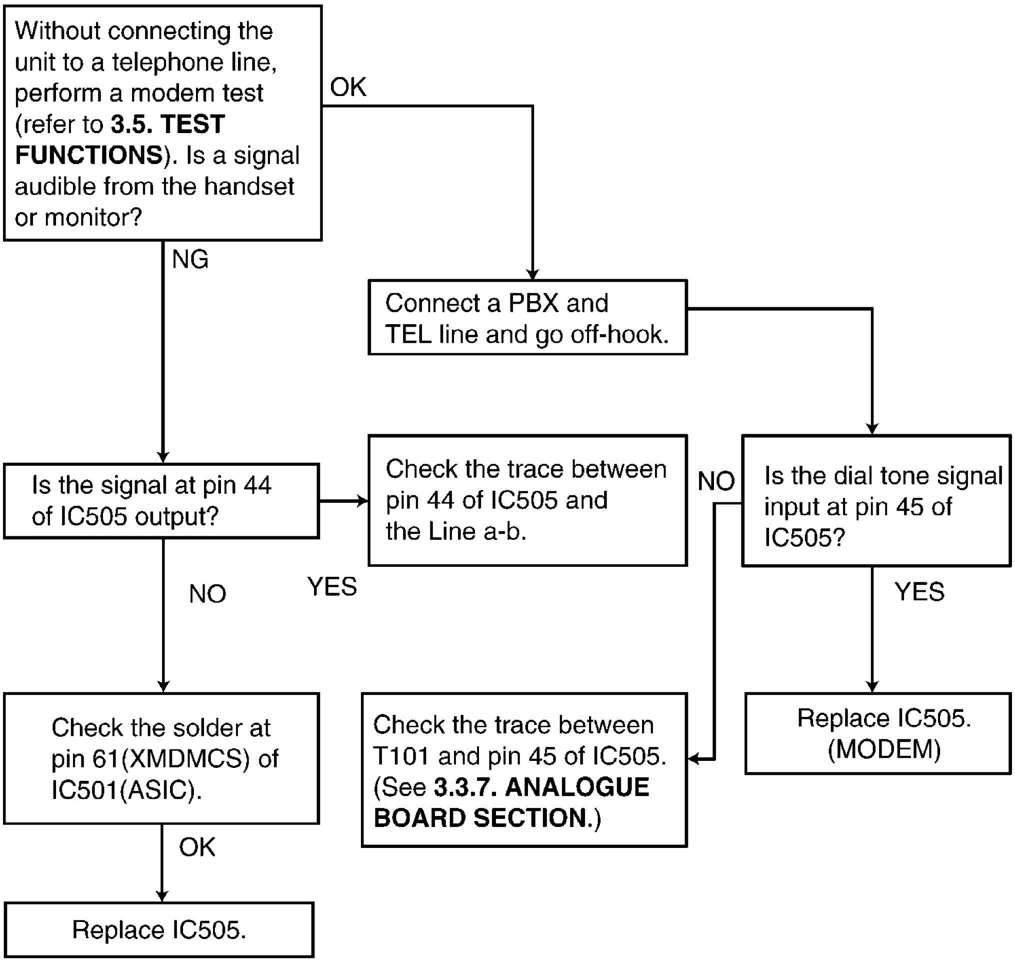
LCD display messages indicating the error causes are shown below. (Refer to LCD MESSAGES ())

CHECK PAPER

COVER OPEN

UNIT OVERHEATED (COVER OPEN, etc.)...Reset the unit.
PAPER JAMMED
CHECK FILM
Please refer to USER RECOVERABLE ERRORS () for the above items. If it turns out to be a hardware deformity, please check each sensor. (Refer to TEST FUNCTIONS ().)

3.3.5.1.4. THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE


Without connecting the unit to a telephone line, perform a modem test (refer to **3.5. TEST FUNCTIONS**). Is a signal audible from the handset or monitor?
OK
NG
Connect a PBX and TEL line and go off-hook.
Is the signal at pin 44 of IC505 output?
Check the trace between pin 44 of IC505 and the Line a-b.
NO
Is the dial tone signal input at pin 45 of IC505?
NO
YES
YES
Check the solder at pin 61(XMDMCS) of IC501(ASIC).
Check the trace between T101 and pin 45 of IC505. (See **3.3.7. ANALOGUE BOARD SECTION**.)
Replace IC505. (MODEM)
OK
Replace IC505.

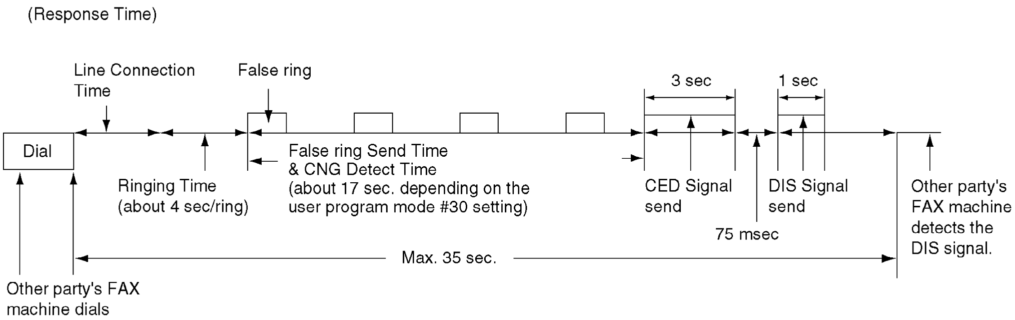
CROSS REFERENCE:
ANALOGUE BOARD SECTION()
TEST FUNCTIONS()

3.3.5.1.5. THE UNIT CAN COPY, BUT CANNOT EITHER TRANSMIT/RECEIVE LONG DISTANCE OR INTERNATIONL COMMUNICATIONS

The following two causes can be considered for this symptom.

Cause 1:
The other party is executing automatic dialing, the call has been received by this unit, and the CED or DIS signal response time is too long. (In most cases, this unit detects the CNG signal

and can respond to CED or DIS.) (According to the ITU-T standard, the communication procedure is cancelled when there is no response from the other party within 35 sec, so that the other party releases the line.)


(Response Time)
Line Connection Time
False ring
3 sec
1 sec
Dial
Ringing Time (about 4 sec/ring)
False ring Send Time & CNG Detect Time (about 17 sec. depending on the user program mode #30 setting)
CED Signal send
DIS Signal send
75 msec
Other party's FAX machine detects the DIS signal.
Max. 35 sec.
Other party's FAX machine dials

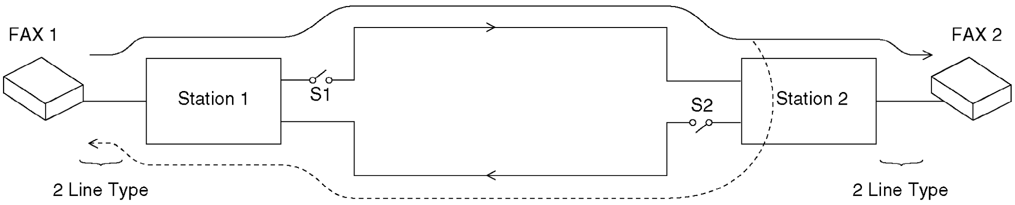
(Cause and Countermeasure)

As shown in the chart above, the total handshaking time must be reduced, but because of the long distance connection and linking of several stations, the line connection time cannot be reduced. Accordingly, the following countermeasures should be tried.

(A)... As the 35 sec. count is started directly after dialing or directly after the START button has been pressed for models with a START button, the other party should be called manually, if possible. Another possibility is entering two pauses at the end of the auto dial number on the transmission side. Then the count start time can be delayed for 2 pauses (about 10 sec.).

Cause 2:

Erroneous detection because of an echo or an echo canceler.


FAX 1
FAX 2
Station 1
S1
S2
Station 2
2 Line Type
2 Line Type

(Echo/Echo Canceler)

The signal from FAX1 reaches FAX2 via stations 1 and 2, but the reflection signal at station 2 also returns via station 1 (echo). As the distance between station 1 and station 2 is far, the echo returns to FAX 1 at a max of 600 msec after transmission. There is a possibility that this signal is detected erroneously as the signal from FAX2. For a normal call, there is also a possibility that the echo of their own voice will make the call difficult to understand. For this reason, each station (station 1 and station 2) attaches echo cancelers (S1 and S2) for international lines or long distance lines. For the echo canceler, the level of the transmission signal from FAX 1 is compared with the level of the reception signal from FAX2. When the transmission signal is larger, S1 is closed while S2 is opened when it is smaller. In other words, for transmission from FAX1, S1 is closed and S2 is open, so that the echo does not return to FAX1.

(Causes and Countermeasures)

No.	Countermeasure Side	Echo Communication Problem Example	Countermeasure	Service
1	Sending side	Some time is needed to compare the level of the receiving and sending signals for the echo canceler. The header of the training signal lacks due to a switching delay to close S1.	Add a dummy signal to the beginning of the training signal.	Service co (Internatio sele This counte becomes t valu
2	Receiving side	The echo canceler function stops according to a CED signal frequency of 2100Hz (S1 and S2 are both ON), a DIS signal is returned as an echo, and a DCS signal from the sending side overlaps the DIS echo. Then the receiving side FAX cannot retrieve the DCS signal. (Refer to Fig. a)	Change to a 1100Hz CED signal frequency. (Refer to Fig. b)	Service co (CED fre sele
	Receiving side		Change the regular rime of 75 msec between the CED signal and DIS signal to 500 msec. This will give at least 250 msec to recover the echo canceler operation. (Refer to Fig. c)	Service co (Time betw and 30
	Sending side		The sending side FAX sends a DCS signal not after receiving the 1st DIS signal but after receiving the 2nd DIS signal. (Refer to Fig. d)	Service co (Overse detection
3	Sending side	Communication failure occurs in a long distance communication on the telephone line without an echo canceler. or There are some cases (e.g. Mobil comms.) which cause the collision of TX / RX signals due to the delay / echo and noise of the network / terminal. (Refer to Fig. e)	Decrease the transmission level from -10 dBm to -15 dBm and the echo level will decrease.	Service co (Transmit
4	Sending side Receiving side		Decrease the receiving sensitivity from -13 dBm to about -32 dBm so an echo signal will not received.	Service co (Receiving
5	Sending side Receiving side		Set additional Pause time (Service mode: code No. 774) in between the original and its repeated signals, to prevent the collision of the signals at both end.	Service co (T4 ti

Fig. a (Overlapping the Echo of the DIS signal and DCS signal)

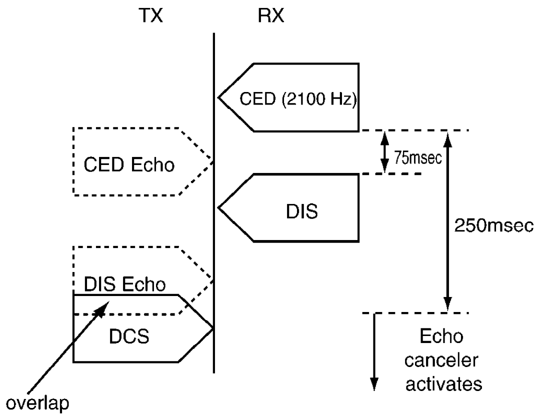

TX
RX
CED (2100 Hz)
CED Echo
75msec
DIS
250msec
DIS Echo
DCS
Echo
canceler
activates
overlap

Fig. b (Countermeasure by Changing the CED Frequency)

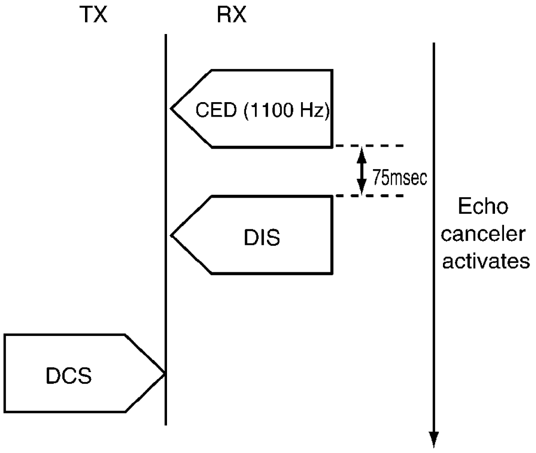

TX
RX
CED (1100 Hz)
75msec
Echo
canceler
activates
DIS
DCS

Fig. c (Countermeasure by Changing the Interval Between CED and DIS)

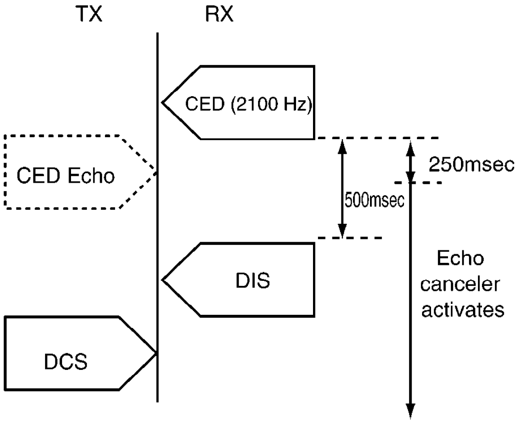
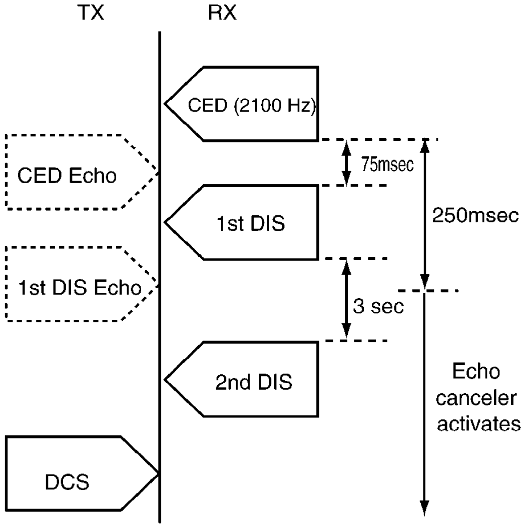
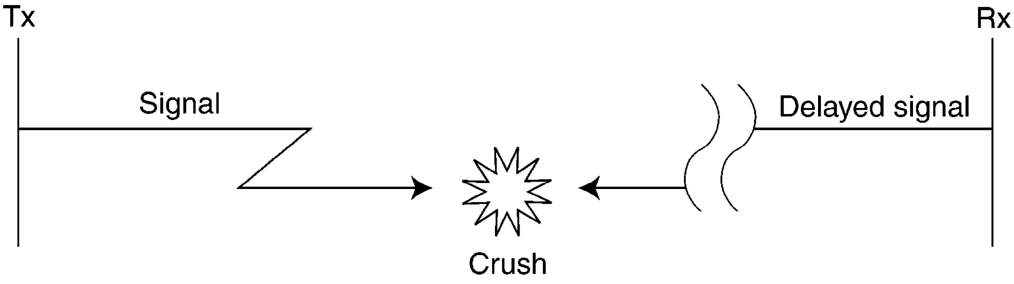

TX
RX
CED (2100 Hz)
CED Echo
250msec
500msec
Echo
canceler
activates
DIS
DCS

Fig. d (Countermeasure by Ignoring the 1st DIS)


TX
RX
CED (2100 Hz)
CED Echo
75msec
250msec
1st DIS
1st DIS Echo
3 sec
2nd DIS
Echo canceler activates
DCS

<TX side signal>	**<RX side signal>**	**<Countermeasure>**
2nd / 3rd DCS / Training	**& delayed CFR / FTT**	**at TX side**
2nd / 3rd EOP / EOM / MPS	**& delayed MCF / PIP / PIN / RTP / RTN**	**at TX side**
delayed DCS	**& 2nd / 3rd / --- DIS**	**at RX side**

(Fig. e)


Tx
Rx
Signal
Delayed signal
Crush

3.3.5.1.6. THE UNIT CAN COPY, BUT THE TRANSMISSION AND RECEPTION IMAGE ARE INCORRECT

(Long distance or international communication operation)
This symptom highly depends on the transmission and reception capability of the other FAX unit and the line conditions.
The countermeasures for this unit are shown below.

Transmission Operation:
Set the transmitting speed to 4800BPS (service mode: code No. 717) or select the overseas mode.

Reception Operation:
If 80% or more of the reception is incorrect, set the receiving speed to 4800BPS. (Service mode:

code No. 718)

- Refer to SERVICE FUNCTION TABLE().

3.3.5.1.7. HOW TO RECORD FAX SIGNAL BY USING PC

Recording FAX signal is one of the useful analysis measures to solve communication problems. The way of recording easily by using PC is shown as follows.

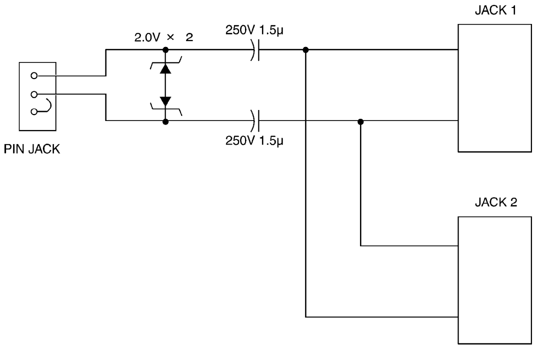
1. Equipment

- **1 jig**
- **1 PC (with LINE IN)**
- **1 audio cord (mini jack supported)**
- **2 tel cords**

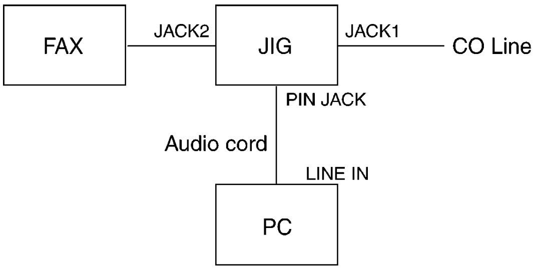
Parts No.	Parts Name & Description	Qt'y
PQJJ1T004Z	JACK1, JACK2	2
PQJJ1D010Z	PIN JACK	1
ECQE2155KF or ECQE2E155KC	CAPACITOR	2
MA4020	DIODE	2

2. Setting up

FAX SIGNAL RECORDING JIG



3. Connecting PC and JIG


FAX
JACK2
JIG
JACK1
CO Line
PIN JACK
Audio cord
LINE IN
PC

4. PC setting and recording

1. Set LINE IN to be valid in the volume control setting.
Refer to the PC instruction book.

2. Start up the PC software “ SOUND RECORDER”. (This software is bundled to Windows OS, which can create WAV file.)
Set the audio format “ PCM 22.050kHz, 8bit, mono”.

3. Click the record button and start recording after acquisition the signal.

Note:

- **Not to be wind wave patterns on the wave monitor.**
- **Please compress the recording data when you send attaching to E-Mail because the data size will be so heavy.**
- **Any software which can create WAV files is available.**

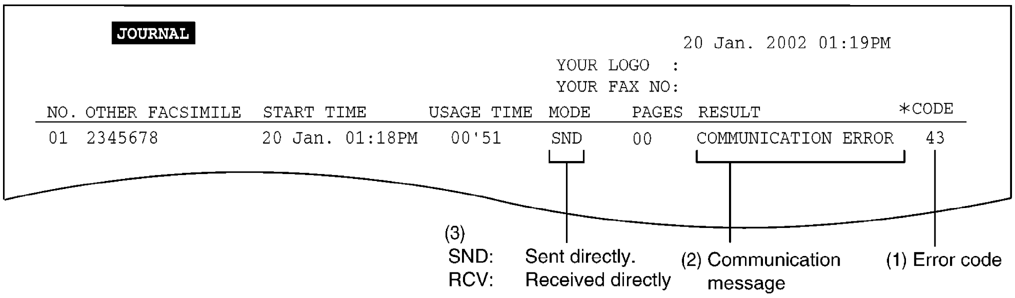
3.3.5.1.8. HOW TO OUTPUT THE JOURNAL REPORT

1. Press the MENU button 2 times.

2. Press ◄ or ► until the “ Journal ” is displayed.

3. Press the SET button.

4. The report prints out.



```
JOURNAL
                                                       20 Jan. 2002 01:19PM
                                                YOUR LOGO   :
                                                YOUR FAX NO:
 NO. OTHER FACSIMILE   START TIME     USAGE TIME  MODE   PAGES  RESULT                *CODE
 01  2345678           20 Jan. 01:18PM   00'51     SND    00    COMMUNICATION ERROR   43
```

(3)
SND: Sent directly.
RCV: Received directly
(2) Communication message
(1) Error code

Error code table:
Refer to ERROR CODE TABLE()

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
A2	PRESSED THE STOP KEY	TX & RX	Communication was interrupted with the STOP button.	
A3	DOCUMENT JAMMED	TX	Document paper is jammed.	
A4	NO DOCUMENT	TX	No document paper.	
A7	THE COVER WAS OPENED	TX & RX	Cover is open.	
A9	COMMUNICATION ERROR	TX & RX	DC LOOP detection/Busy Tone detection.	
26	COMMUNICATION ERROR	RX	DIS is received after transmission.	
27	COMMUNICATION ERROR	RX		
28	COMMUNICATION ERROR	TX & RX		
40	NO RESPONSE	TX	Transmission is finished when T1 TIMER is expired.	1
41	COMMUNICATION ERROR	TX	DCN is received after DCS transmission.	2
42	COMMUNICATION ERROR	TX	FTT is received after transmission of a 2400BPS training signal.	3
43	COMMUNICATION ERROR	TX	No response after post message is transmitted three times.	4
44	COMMUNICATION ERROR	TX	RTN and PIN are received.	5
46	COMMUNICATION ERROR	RX	No response after FTT is transmitted.	6
48	COMMUNICATION ERROR	RX	No post message.	7
49	COMMUNICATION ERROR	RX	RTN is transmitted.	8
50	COMMUNICATION ERROR	RX	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR	RX	PIN is transmitted.	8
52	NO RESPONSE	RX	Reception is finished when the T1 TIMER expired.	9
53	COMMUNICATION ERROR	TX	DCN is received after transmission of NSC and DTC.	10
54	COMMUNICATION ERROR	RX	DCN is received after DIS transmission.	11
57	COMMUNICATION ERROR	TX	300BPS error.	12

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
58	COMMUNICATION ERROR	RX	DCN is received after FTT transmission.	13
59	COMMUNICATION ERROR	TX	DCN responds to post message.	14
59	COMMUNICATION ERROR	TX	DCN responds to post message.	14
64	COMMUNICATION ERROR	TX	Polling is not possible.	15
65	COMMUNICATION ERROR	TX		
68	COMMUNICATION ERROR	RX	No response at the other party after MCF or CFR is transmitted.	13
70	COMMUNICATION ERROR	RX	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR	RX	Carrier is cut when image signal is received.	16
73	COMMUNICATION ERROR	TX & RX	300BPS error.	
74	JUNKMAIL PROH. REJECT	RX	Junk Mail Prohibitory ID ???	
75	MEMORY FULL	RX	The document was not received due to memory full.	
79	CANCELED	TX	The multistation transmission is rejected by user.	
FF	COMMUNICATION ERROR	TX & RX	Modem error.	12

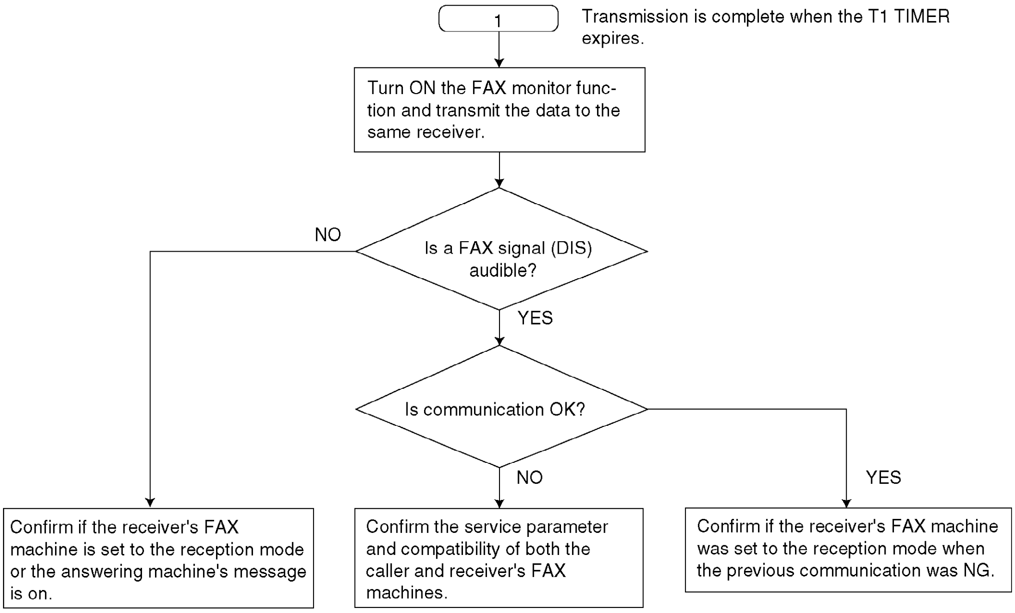
TX=TRANSMISSION RX=RECEPTION

Most fax communication problems can be resolved by the following steps.

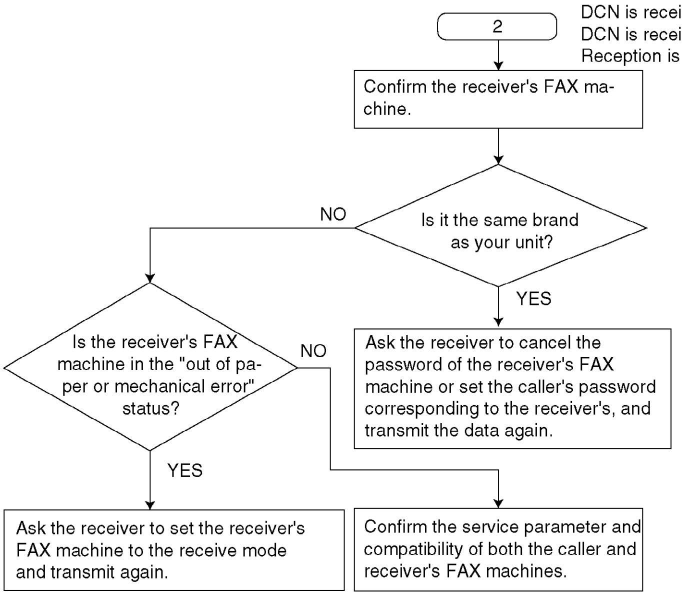
1. Change the transmit level. (Service code: 596, refer to SERVICE FUNCTION TABLE().)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to SERVICE FUNCTION TABLE ().)

Note*:
If the problem remains, see the following "Countermeasure" flow chart.

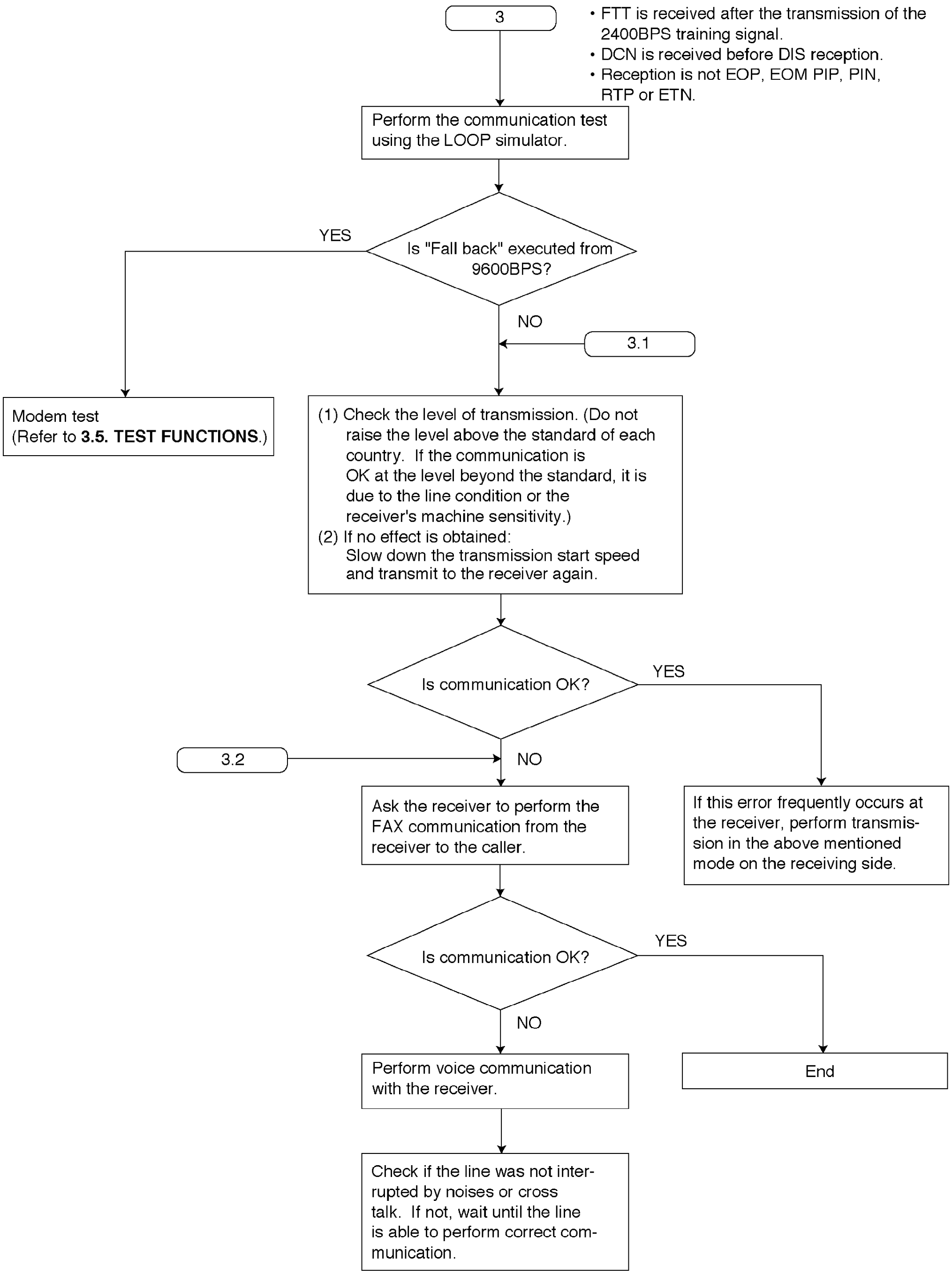
Countermeasure


Transmission is complete when the T1 TIMER expires.

1
Turn ON the FAX monitor function and transmit the data to the same receiver.
Is a FAX signal (DIS) audible?
NO
YES
Is communication OK?
NO
YES
Confirm if the receiver's FAX machine is set to the reception mode or the answering machine's message is on.
Confirm the service parameter and compatibility of both the caller and receiver's FAX machines.
Confirm if the receiver's FAX machine was set to the reception mode when the previous communication was NG.


DCN is received after DCS transmission.
DCN is received after FTT transmission.
Reception is not EOP, EOM PIN, RTP or RTN.

2
Confirm the receiver's FAX machine.
Is it the same brand as your unit?
NO
YES
Is the receiver's FAX machine in the "out of paper or mechanical error" status?
NO
YES
Ask the receiver to cancel the password of the receiver's FAX machine or set the caller's password corresponding to the receiver's, and transmit the data again.
Ask the receiver to set the receiver's FAX machine to the receive mode and transmit again.
Confirm the service parameter and compatibility of both the caller and receiver's FAX machines.

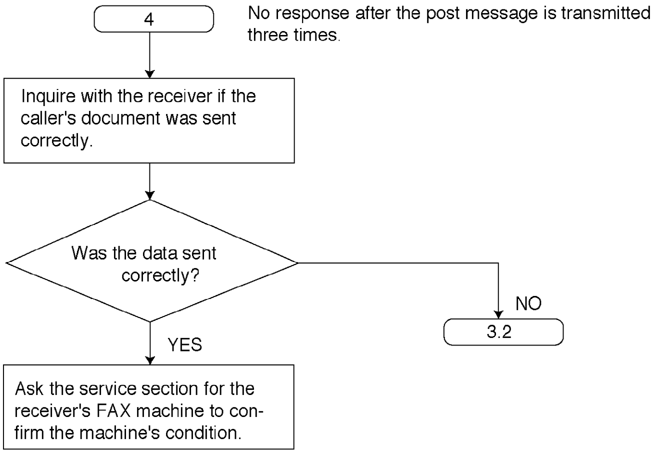


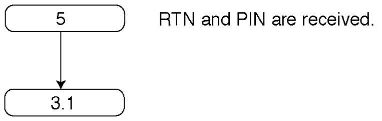
- FTT is received after the transmission of the 2400BPS training signal.
- DCN is received before DIS reception.
- Reception is not EOP, EOM PIP, PIN, RTP or ETN.

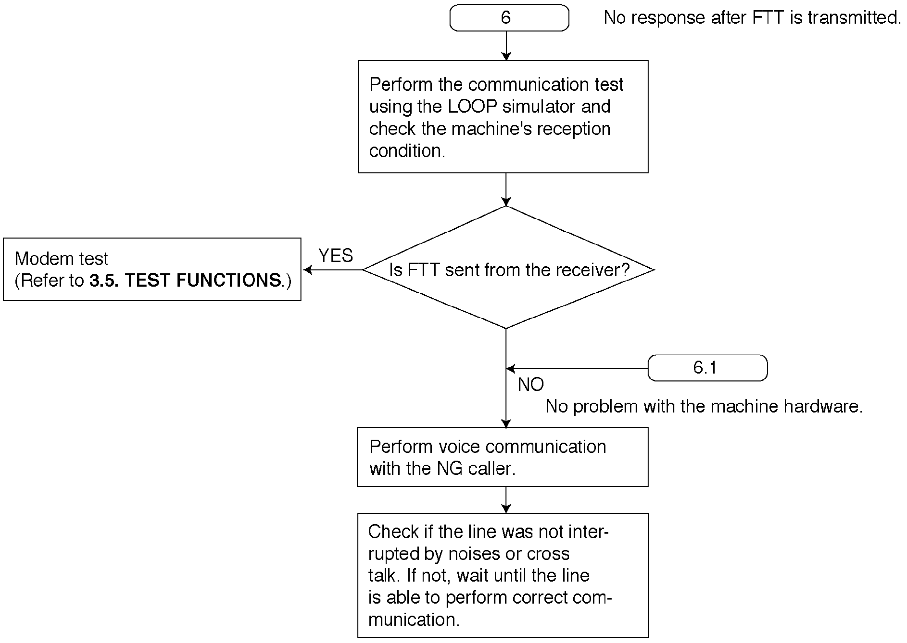
3
Perform the communication test using the LOOP simulator.
Is "Fall back" executed from 9600BPS?
YES
Modem test
(Refer to **3.5. TEST FUNCTIONS**.)
NO
3.1
(1) Check the level of transmission. (Do not raise the level above the standard of each country. If the communication is OK at the level beyond the standard, it is due to the line condition or the receiver's machine sensitivity.)
(2) If no effect is obtained: Slow down the transmission start speed and transmit to the receiver again.
Is communication OK?
YES
If this error frequently occurs at the receiver, perform transmission in the above mentioned mode on the receiving side.
3.2
NO
Ask the receiver to perform the FAX communication from the receiver to the caller.
Is communication OK?
YES
End
NO
Perform voice communication with the receiver.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.

CROSS REFERENCE:

TEST FUNCTIONS()

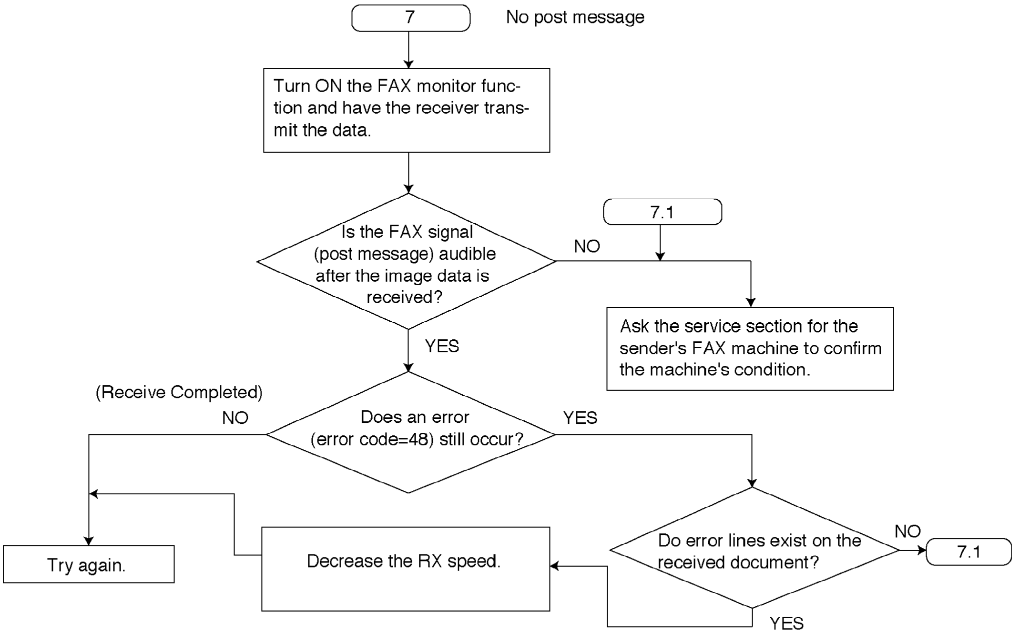

4
No response after the post message is transmitted three times.
Inquire with the receiver if the caller's document was sent correctly.
Was the data sent correctly?
NO
3.2
YES
Ask the service section for the receiver's FAX machine to confirm the machine's condition.


5
RTN and PIN are received.
3.1

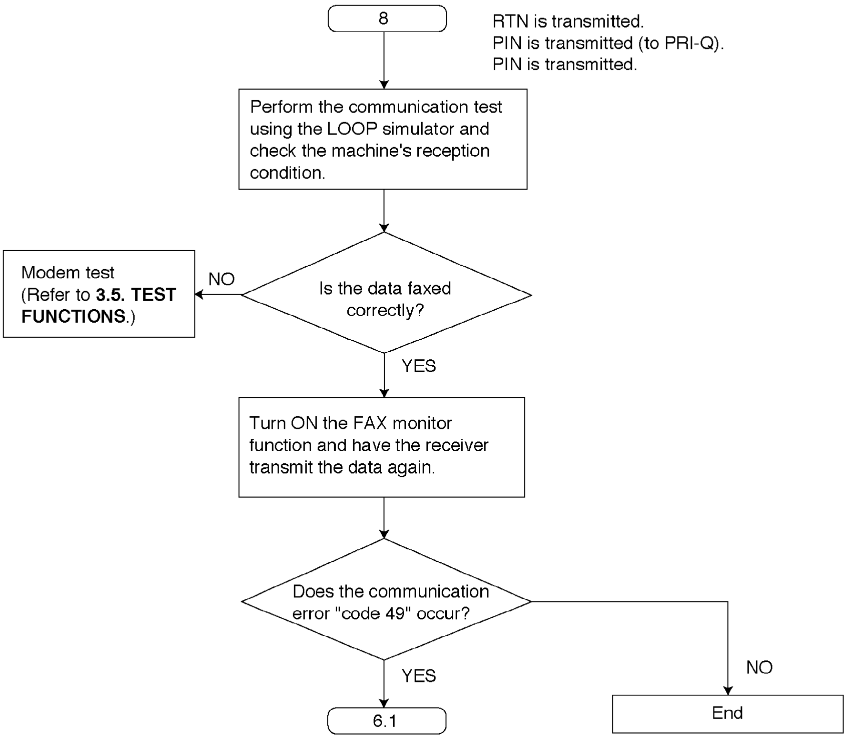

6
No response after FTT is transmitted.
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Modem test
(Refer to 3.5. TEST FUNCTIONS.)
YES
Is FTT sent from the receiver?
6.1
NO
No problem with the machine hardware.
Perform voice communication with the NG caller.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.

CROSS REFERENCE:

TEST FUNCTIONS()

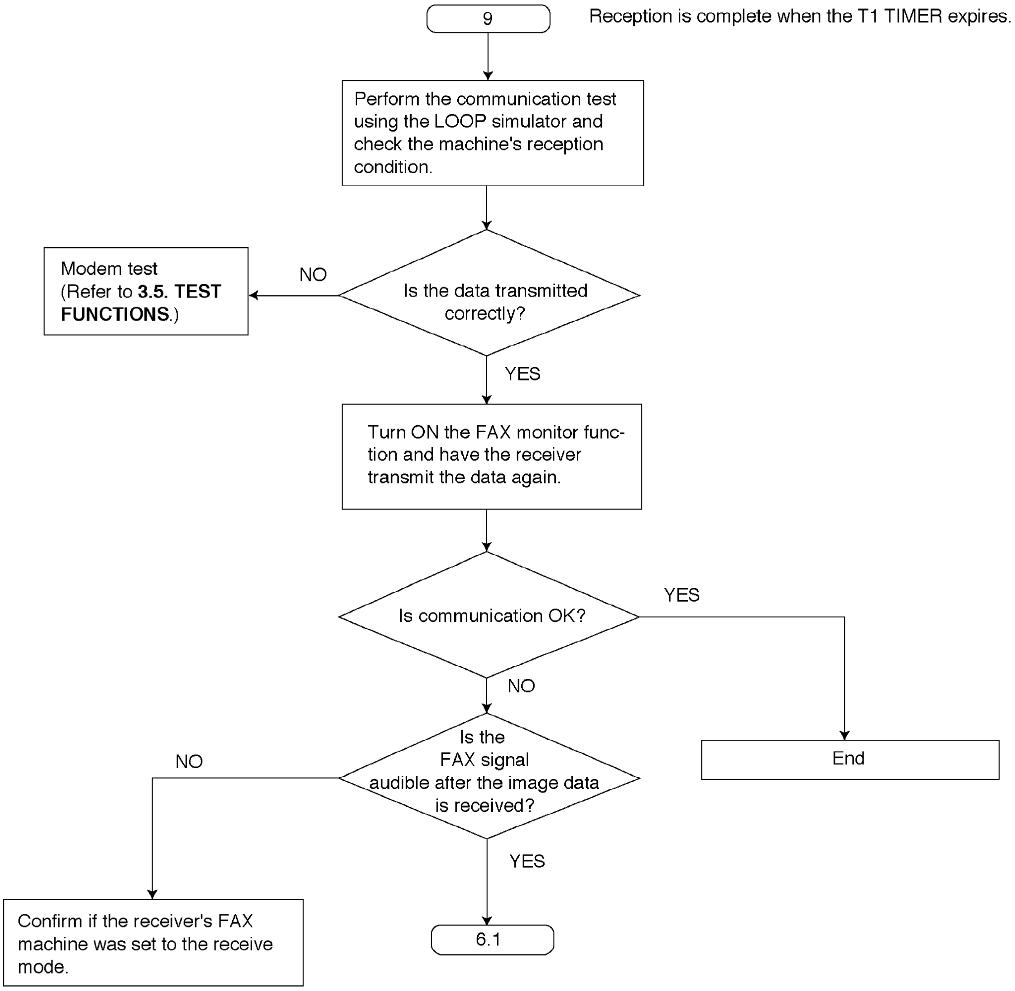

No post message

7
Turn ON the FAX monitor function and have the receiver transmit the data.
Is the FAX signal (post message) audible after the image data is received?
NO
7.1
Ask the service section for the sender's FAX machine to confirm the machine's condition.
YES
(Receive Completed)
NO
Does an error (error code=48) still occur?
YES
Try again.
Decrease the RX speed.
Do error lines exist on the received document?
NO
7.1
YES


RTN is transmitted.
PIN is transmitted (to PRI-Q).
PIN is transmitted.

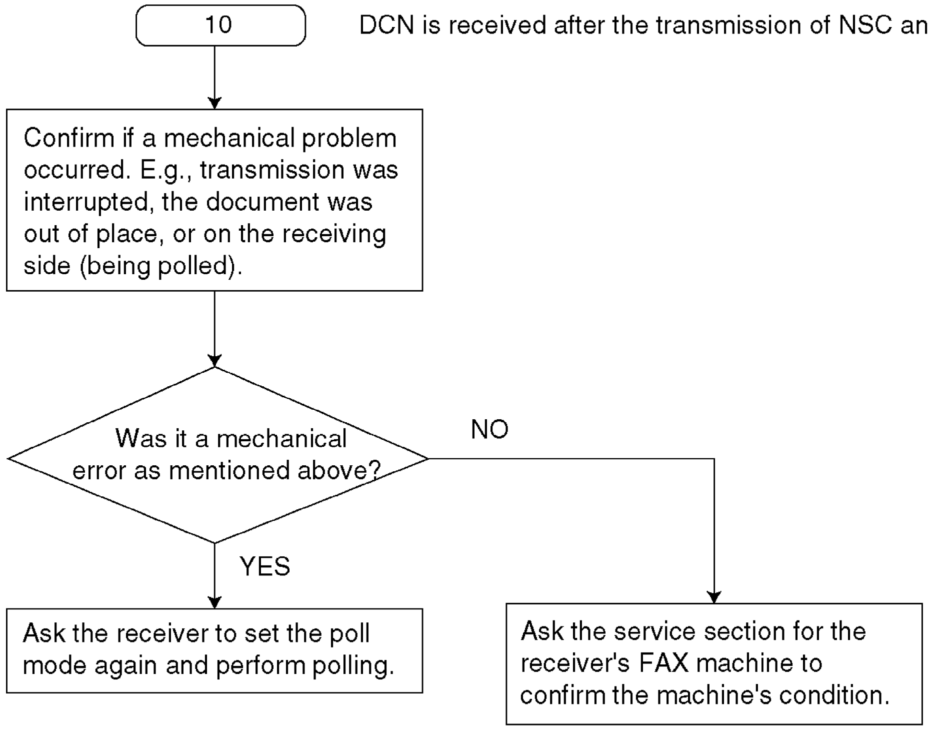
8
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Modem test (Refer to **3.5. TEST FUNCTIONS**.)
NO
Is the data faxed correctly?
YES
Turn ON the FAX monitor function and have the receiver transmit the data again.
Does the communication error "code 49" occur?
YES
6.1
NO
End

CROSS REFERENCE:
TEST FUNCTIONS()


9
Reception is complete when the T1 TIMER expires.
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Is the data transmitted correctly?
NO
Modem test (Refer to **3.5. TEST FUNCTIONS**.)
YES
Turn ON the FAX monitor function and have the receiver transmit the data again.
Is communication OK?
YES
End
NO
Is the FAX signal audible after the image data is received?
NO
Confirm if the receiver's FAX machine was set to the receive mode.
YES
6.1

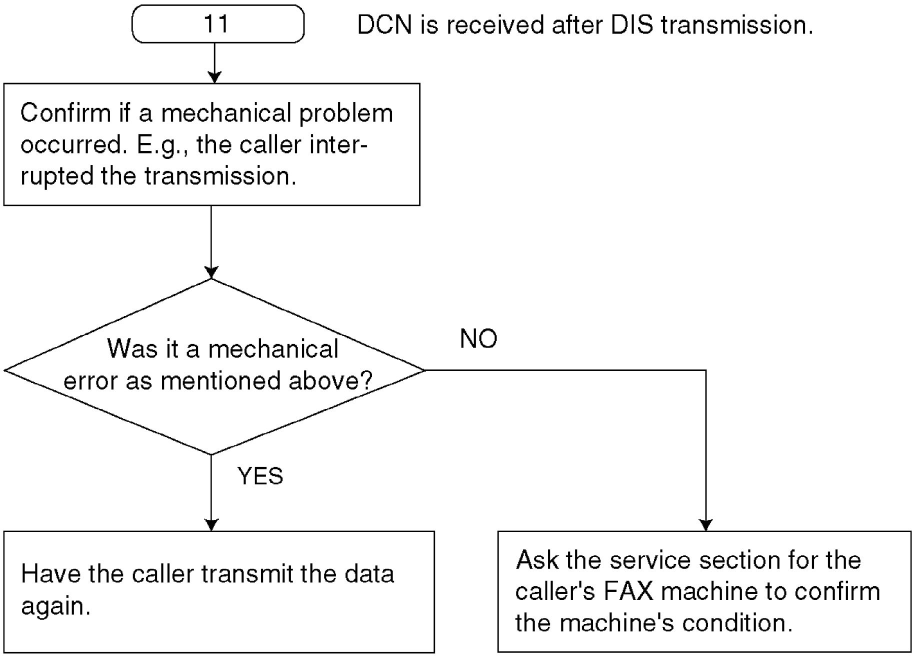
CROSS REFERENCE:

TEST FUNCTIONS()



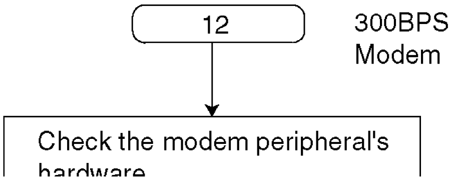
DCN is received after the transmission of NSC and DTC.

10
Confirm if a mechanical problem occurred. E.g., transmission was interrupted, the document was out of place, or on the receiving side (being polled).
Was it a mechanical error as mentioned above?
NO
YES
Ask the receiver to set the poll mode again and perform polling.
Ask the service section for the receiver's FAX machine to confirm the machine's condition.



DCN is received after DIS transmission.

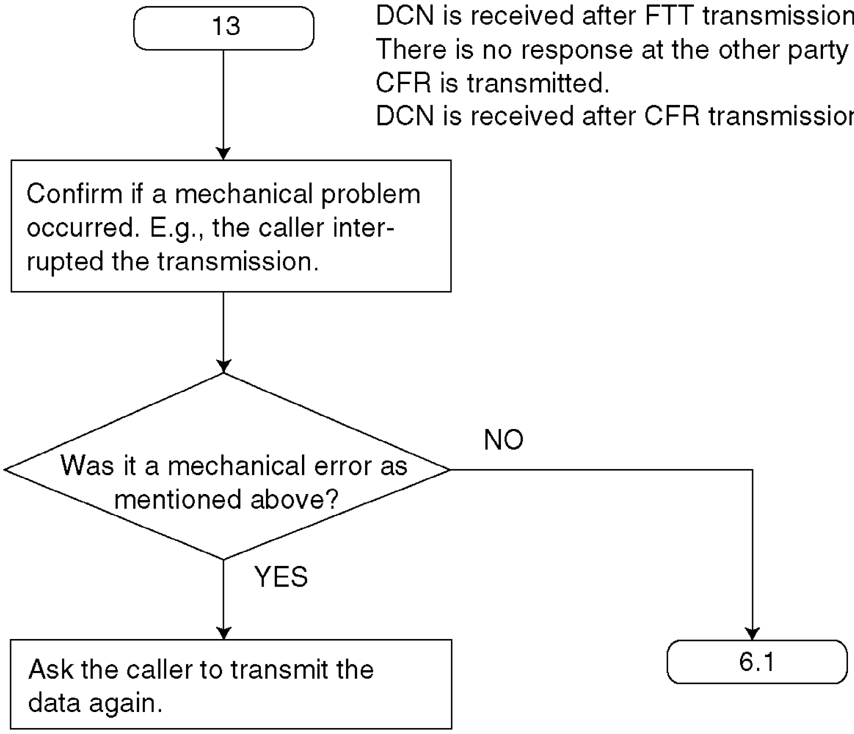
11
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Have the caller transmit the data again.
Ask the service section for the caller's FAX machine to confirm the machine's condition.



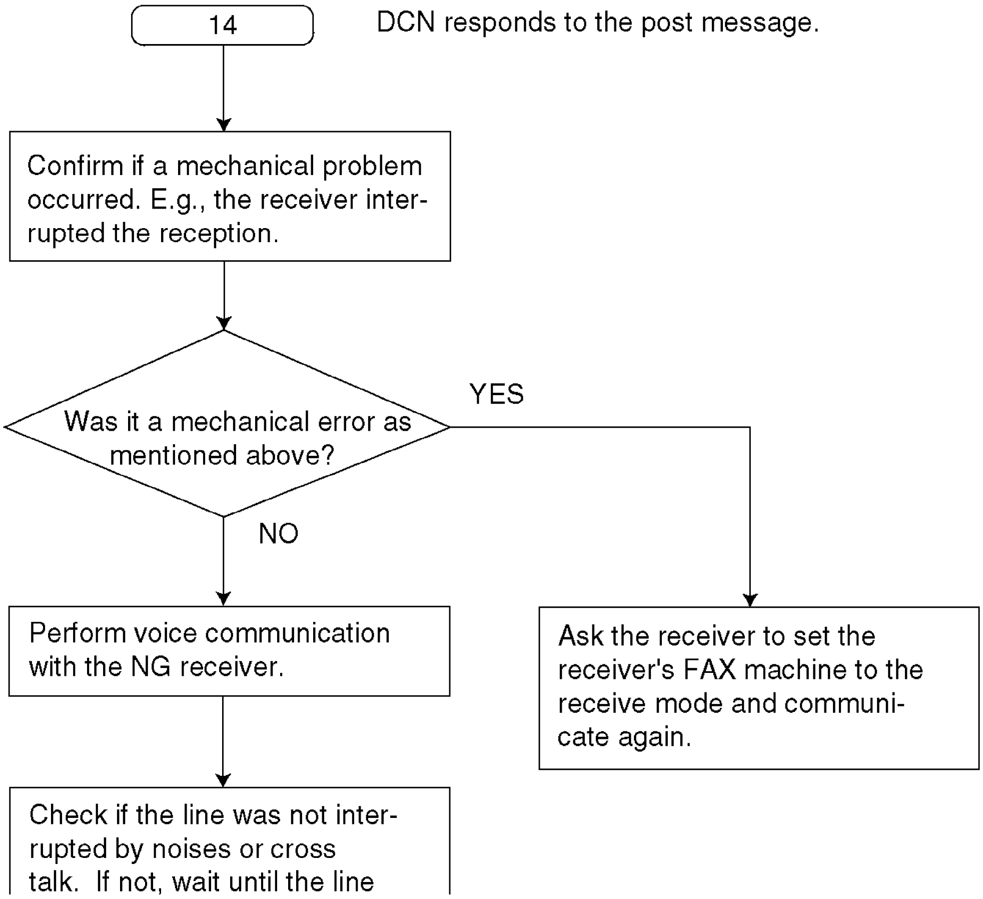
300BPS error
Modem error

12
Check the modem peripheral's hardware

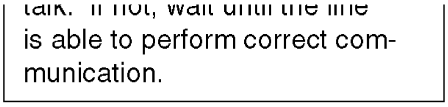
hardware.

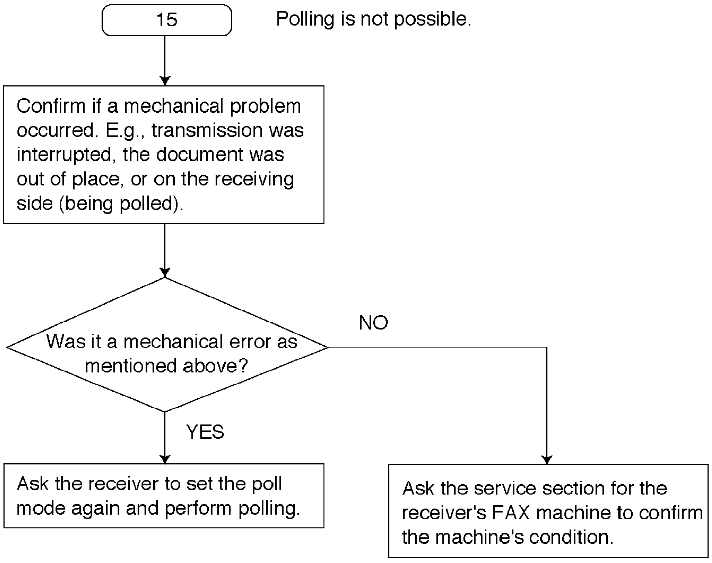

13
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Ask the caller to transmit the data again.
6.1

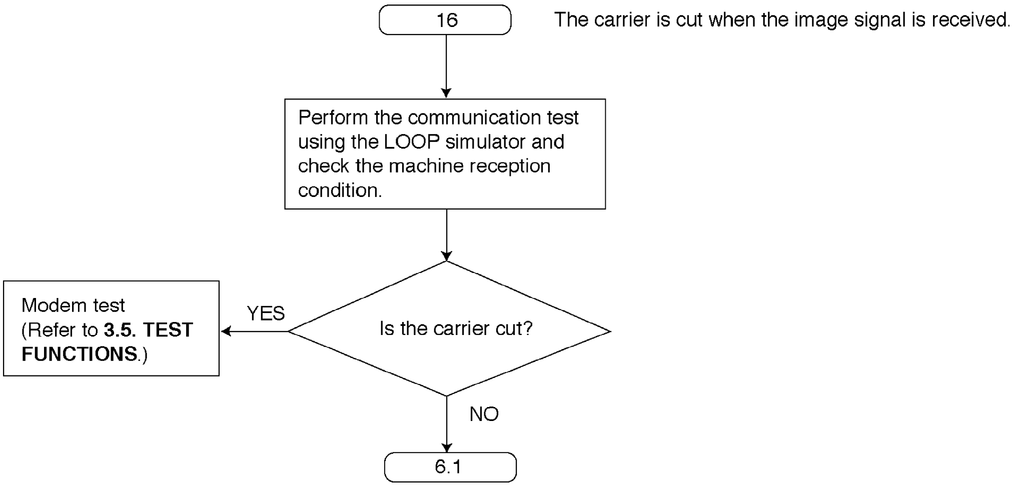
DCN is received after FTT transmission.
There is no response at the other party after MCF or CFR is transmitted.
DCN is received after CFR transmission.


14
Confirm if a mechanical problem occurred. E.g., the receiver interrupted the reception.
Was it a mechanical error as mentioned above?
YES
NO
Perform voice communication with the NG receiver.
Ask the receiver to set the receiver's FAX machine to the receive mode and communicate again.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line

DCN responds to the post message.


is able to perform correct com-
munication.


15
Polling is not possible.
Confirm if a mechanical problem occurred. E.g., transmission was interrupted, the document was out of place, or on the receiving side (being polled).
Was it a mechanical error as mentioned above?
NO
YES
Ask the receiver to set the poll mode again and perform polling.
Ask the service section for the receiver's FAX machine to confirm the machine's condition.


16
The carrier is cut when the image signal is received.
Perform the communication test using the LOOP simulator and check the machine reception condition.
Is the carrier cut?
YES
Modem test (Refer to 3.5. TEST FUNCTIONS.)
NO
6.1

CROSS REFERENCE:
TEST FUNCTIONS()

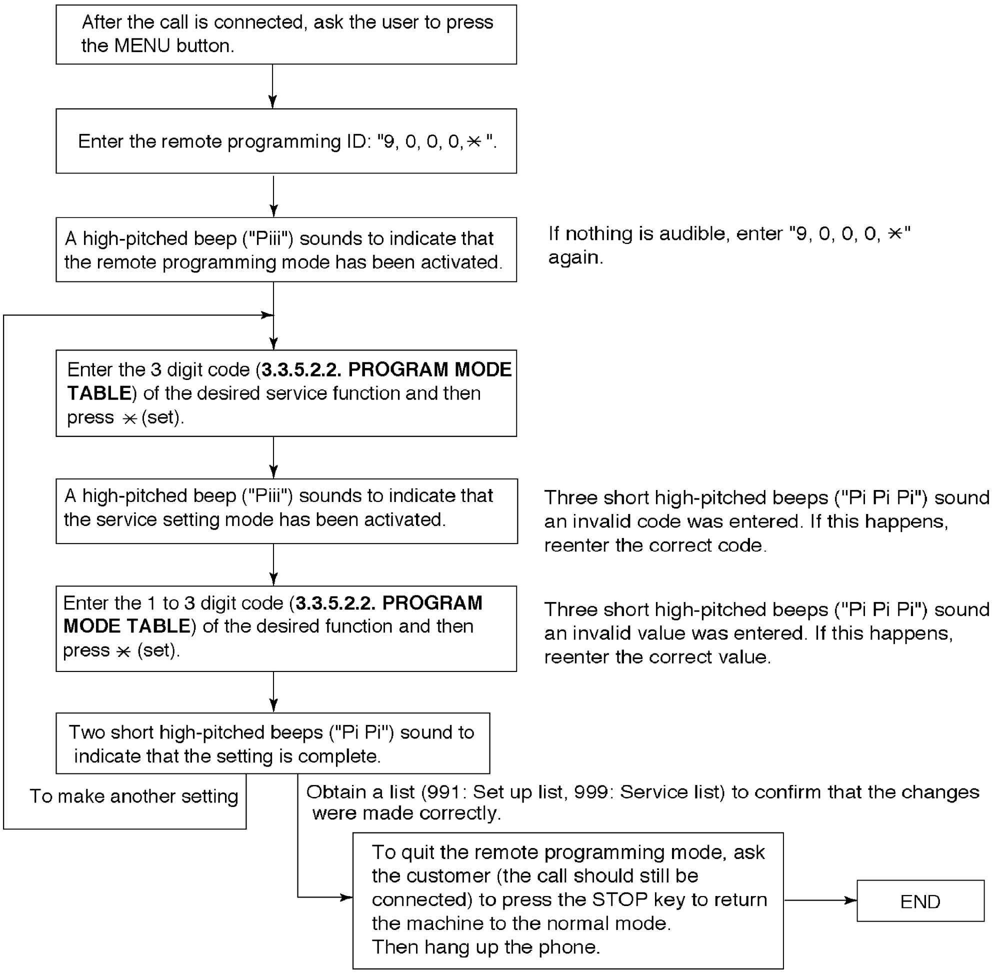
3.3.5.2. REMOTE PROGRAMMING

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (PROGRAM MODE TABLE ()). The function used to accomplish this is remote programming.

First, in order to check the current status of the service code parameter, print out the setup list (code: 991) and the service list (code: 999) from the customer's fax machine.
Based on this, the parameters for the desired codes can be changed.
The procedure for changing and listing parameters is described on ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES(). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that the changes were made correctly.

Hint:
Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone. This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

3.3.5.2.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES


After the call is connected, ask the user to press the MENU button.
Enter the remote programming ID: "9, 0, 0, 0, *".
A high-pitched beep ("Piii") sounds to indicate that the remote programming mode has been activated.
If nothing is audible, enter "9, 0, 0, 0, *" again.
Enter the 3 digit code (3.3.5.2.2. PROGRAM MODE TABLE) of the desired service function and then press * (set).
A high-pitched beep ("Piii") sounds to indicate that the service setting mode has been activated.
Three short high-pitched beeps ("Pi Pi Pi") sound if an invalid code was entered. If this happens, reenter the correct code.
Enter the 1 to 3 digit code (3.3.5.2.2. PROGRAM MODE TABLE) of the desired function and then press * (set).
Three short high-pitched beeps ("Pi Pi Pi") sound if an invalid value was entered. If this happens, reenter the correct value.
Two short high-pitched beeps ("Pi Pi") sound to indicate that the setting is complete.
To make another setting
Obtain a list (991: Set up list, 999: Service list) to confirm that the changes were made correctly.
To quit the remote programming mode, ask the customer (the call should still be connected) to press the STOP key to return the machine to the normal mode.
Then hang up the phone.
END

CROSS REFERENCE:
PROGRAM MODE TABLE()

3.3.5.2.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	Remote Setting
001	Set date and time	dd/mm/yy hh/mm	01/Jan/02	NG
002	Your logo	---------	None	NG
003	Your FAX number	---------	None	NG
004	Print sending report	1: ERROR / 2: ON / 3: OFF	ERROR	OK
006	FAX ring count	1~9	2	OK
008	Mode reception manual (KX-FP151SP only)	1:TEL 2:TEL/FAX	TEL	NG
013	Dialing mode (KX-FP151SP only)	1: PULSE / 2: TONE	TONE	OK
017	Ringer pattern	1:A / 2:B / 3:C	A	OK
022	Journal auto print	1: ON / 2: OFF	ON	OK
023	Overseas mode	1: ON / 2: OFF	OFF	OK
025	Delayed transmission	ON / OFF	OFF	NG
026	Auto caller ID list	1: ON / 2: OFF	ON	OK
030	Silent FAX recognition ring	3 to 9 rings	3	OK
034	Quick scan	1: ON / 2: OFF	OFF	OK
036	Rx reduction	1: 92% / 2: 86% / 3: 72% / 4: 100%	92%	OK
039	LCD contrast	NORMAL / DARKER	Normal	NG
041	Remote FAX activation code	ON / OFF	ON ID=*9	NG
044	Memory receive alert	1: ON / 2: OFF	ON	OK
046	Friendly reception	1: ON / 2: OFF	ON	OK
048	Language (KX-FP151SP only)	1: Spanish / 2: Portuguese	Spanish	OK
049	Auto disconnect	1:ON / 2:OFF	ON ID=*0	NG
068	ECM selection	ON / OFF	ON	NG
070	FAX pager call	ON / OFF	OFF	NG
074	Location (KX-FP151SP only)	1: Spain / 2:Portugal	Spain	OK
076	Connecting tone	1: ON / 2:OFF	ON	OK
077	Auto answer mode (KX-FP151E, KX-FP151GR)	1: TEL/FAX / 2: FAX Only	FAX only	OK
078	TEL/FAX delayed ring	1 to 9 rings	2	OK
080	Set default	YES / NO	NO	NG
501	Pause time set	001~600 x 100msec	030	OK
502	Flash time set (KX-FP151E)	01~99 x 10msec	08	OK
	Flash time set (KX-FP151GR)		12	
	Flash time set (KX-FP151SP-#74 is SPAIN)		09	
	Flash time set (KX-FP1551P-#74 is PORTUGAL)		23	

Code	Function	Set Value	Default	Remote Setting
520	CED frequency select	1:2100Hz / 2:1100Hz	2100	OK
521	International mode select	1:ON / 2:OFF	ON	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0km / 2:1.8km / 3:3.6km / 4: 7.2km	0km	OK
524	Transmission equalizer select	1:0km / 2:1.8km / 3:3.6km / 4: 7.2km	0km	OK
546	Flash time (PBX) (KX-FP151E only)	01~99	08	OK
550	Memory clear	---------	---------	NG
551	ROM check	---------	---------	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	---------	---------	NG
555	Scanner test	---------	---------	NG
556	Motor test	---------	---------	NG
557	LED test	---------	---------	NG
558	LCD test	---------	---------	NG
559	Document jam detection	1:ON / 2:OFF	ON	OK
561	Key test	---------	---------	NG
571	ITS auto redial time set	00~14	05	OK
572	ITS auto redial line disconnection time set	005~999sec	065	OK
573	Remote turn-on ring number	01~99	10	OK
575	OFF-Hook alarm option (KX-FP151GR, KX-FP151SP)	1:ON / 2:OFF	OFF	OK
590	FAX auto redial time set	00~14	05	OK
591	FAX auto redial line disconnection time set	005~999sec	065	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300 bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection	1:1st / 2:2nd	1st	OK
595	Receive error limit value	1~4	2	OK
596	Transmit level set	-15~00dBm	09	OK
598	Receiving Sensitivity	20~48	40	OK
599	ECM Frame size	1:256/ 2:64	256byte	OK
711	Select dial mode (KX-FP151E, KX-FP151GR)	1: PULSE / 2: TONE	TONE	NG
717	Transmit speed select	1:9600/ 2:7200/ 3:4800/ 4: 2400	9600bps	OK
718	Receive speed select	1:9600/ 2:7200/ 3:4800/ 4: 2400	9600bps	OK
719	Ringer off in TEL/FAX mode	1:ON / 2:OFF	ON	OK
722	Redial tone detect	1:ON / 2:OFF	ON	OK

Code	Function	Set Value	Default	Remote Setting
745	Power on film feed	1:ON / 2:OFF	ON	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
771	T1 timer	1:35s / 2:60s	35s	OK
773	DIS-DCS interval (KX-FP151SP only)	1:100 / 2:460 msec	460msec	OK
774	T4 timer	00~99 x 100ms	00	OK
782	Caller ID AC transmit select (KX-FP151E only)	1:ON / 2:OFF	OFF	OK
815	Sensor & VOX test	---------	---------	NG
852	Print test pattern	---------	---------	NG
853	Top margin	1~9	5	OK
861	A4 size set	1:ON / 2:OFF	ON	OK
880	History list	1:Start	---------	NG
881	Journal 2	1:Start	---------	NG
882	Journal 3	1:Start	---------	NG
890	TEL/FAX ring back tone	1:ON / 2:OFF	ON	OK
991	Setup list	1:Start	---------	NG
994	Journal list	1:Start	---------	NG
995	Journal 2 list	1:Start	---------	NG
996	Journal 3 list	1:Start	---------	NG
998	History list	1:Start	---------	NG
999	Service list	1:Start	---------	NG

OK means "can set".
NG means "can not set".

Note:
Refer to SERVICE FUNCTION TABLE () for descriptions of the individual codes.

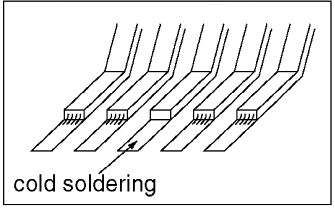
Example:
If you want to set value in the "004 Transmission report mode", press the dial key number 1,2 or 3 corresponding to the Set Value you want to select. (1:ERROR/2:ON/3:OFF)

3.3.6. DIGITAL BOARD SECTION

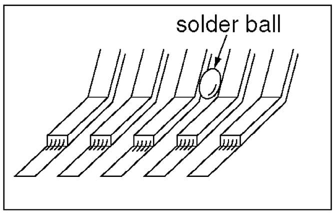
When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.
The symptom: No response when the power is turned on. (No LCD display, and keys are not accepted.)
The first step is to check the power source. If there is no problem with the power supply unit, the problem may lie in the digital unit (main board).
As there are many potential causes in this case (ASIC, DRAM, etc.), it may be difficult to specify what you should check first. If a mistake is made in the order of checks, a normal part may be

determined faulty, wasting both time and money.
Although the tendency is to regard the problem as a serious one (IC malfunction, etc.), usually most cases are caused by solder faults (poor contact due to a tunnel in the solder, signal short circuit due to solder waste).

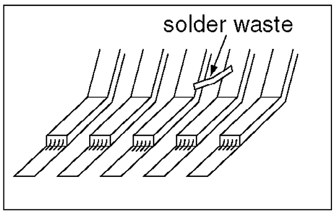
SMT(Surface Mount Type) PARTS



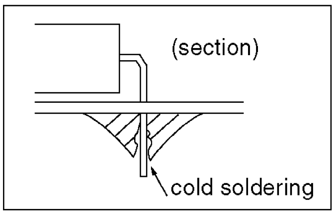
SMT PARTS



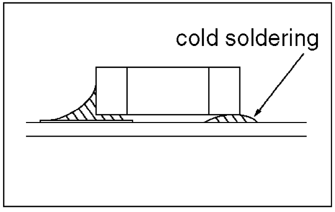
SMT PARTS



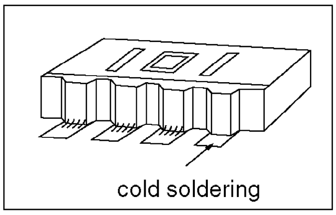
LEADED PARTS



CHIP PARTS (section)



RESISTOR ARRAY



Note:

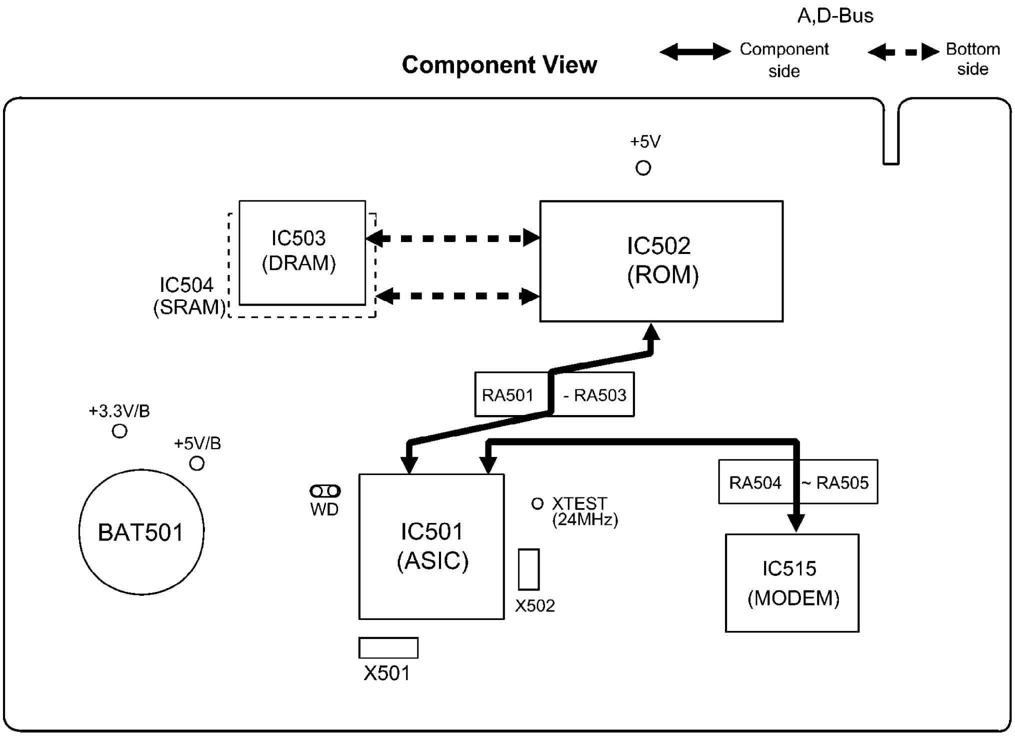
1. **Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.**
2. **Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.**

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially SRAM, DRAM and ROM) malfunctions are extremely rare after installation in the product.)
This may be repaired by replacing the IC, (DRAM etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.
Soldering faults difficult to detect with the naked eye are common, particularly for ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines.
Even if you don’t have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.
An explanation of the main signals (for booting up the unit) is presented below.

Don't replace ICs or stop repairing until checking the signal lines.
An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?
Please refer to DIGITAL BLOCK DIAGRAM ().
The ASIC (IC501) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC502), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.
It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.
These signal lines are all controlled by voltages of 5V (H) or 0V (L).

3.3.6.1. DIGITAL BLOCK DIAGRAM


A,D-Bus
Component View
Component side
Bottom side
+5V
IC503 (DRAM)
IC504 (SRAM)
IC502 (ROM)
RA501
- RA503
+3.3V/B
+5V/B
BAT501
WD
IC501 (ASIC)
XTEST (24MHz)
X502
RA504
~ RA505
IC515 (MODEM)
X501

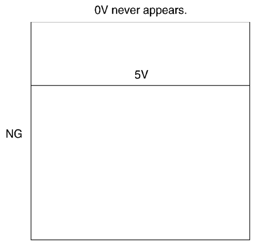
You also need to check the signal lines listed here [List 1] when the unit fails to boot up the system. Those signal lines should remain normal. Other signal lines are not directly related to that failure even if they have faults or troubles.

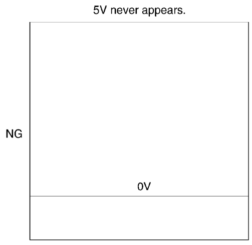
[List 1]

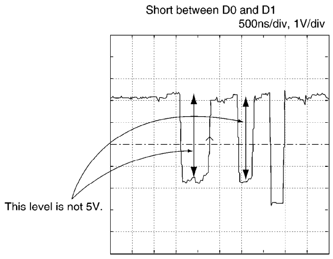
①	D0～D7	(Data Bus)
②	A0～A15	(Address Bus)
③	$\overline{\text{RD}}$	(Read Signal)
	$\overline{\text{ROMCS}}$	(ROM Select Signal)
	$\overline{\text{WR}}$	(Write Signal)
	$\overline{\text{RAMCS}}$	(SRAM Select Signal)
④	RBA0～RBA5	(Bank Address Signal)
⑤	$\overline{\text{RAS}}$	(DRAM Row Address Strobe Signal)
	$\overline{\text{CAS}}$	(DRAM Column Address Strobe Signal)
⑥	$\overline{\text{MDMCS}}$	(Modem Select Signal)

As long as these signals remain normal, once the power is turned on, each IC can repeatedly output 5V (H) and 0V (L). The following shows NG and normal wave patterns.

NG Wave pattern **(Refer to NG EXAMPLE)**

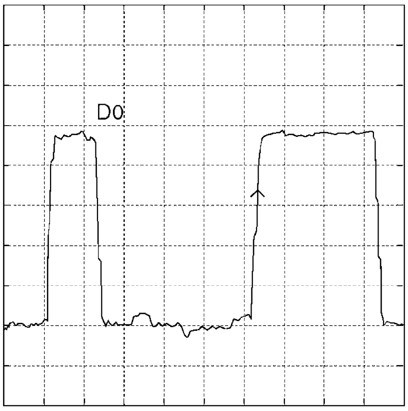




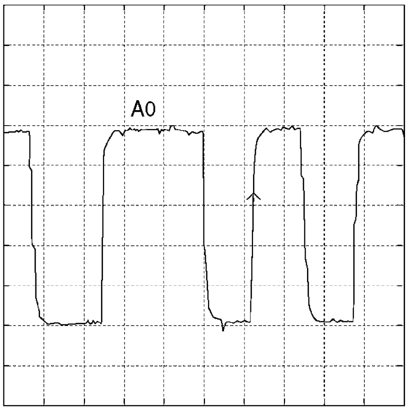


Normal Wave Patterns

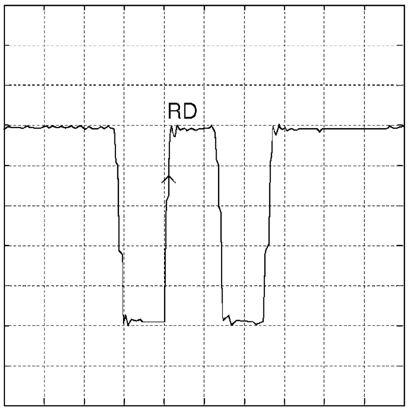
① D0~D7 200ns/div, 1V/div



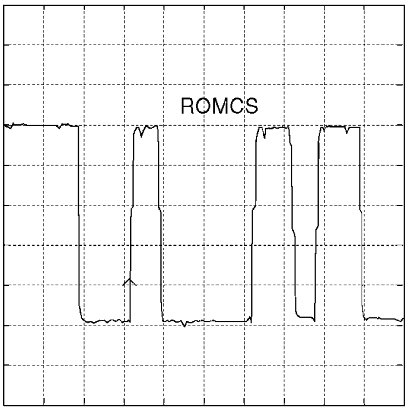
② A0~A5 200ns/div, 1V/div



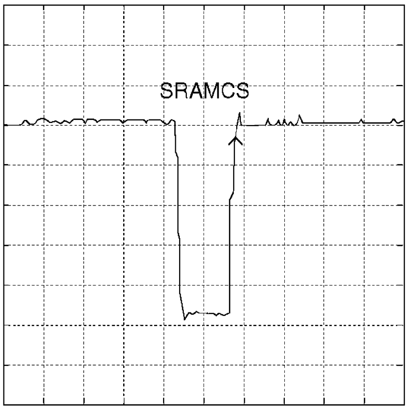
③ $\overline{\text{RD}}$ 100ns/div, 1V/div



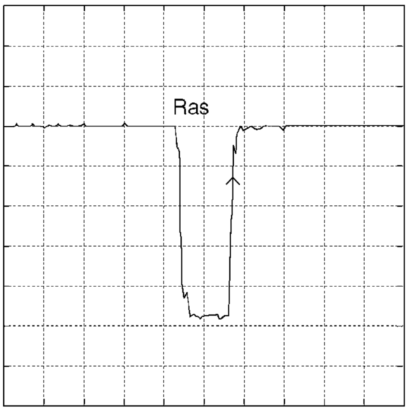
③ $\overline{\text{ROMCS}}$ 500ns/div, 1V/div



③ $\overline{\text{RAMCS}}$ 500ns/div, 1V/div



⑤ $\overline{\text{RAS}}$, $\overline{\text{CAS}}$ 100ns/div, 1V/div

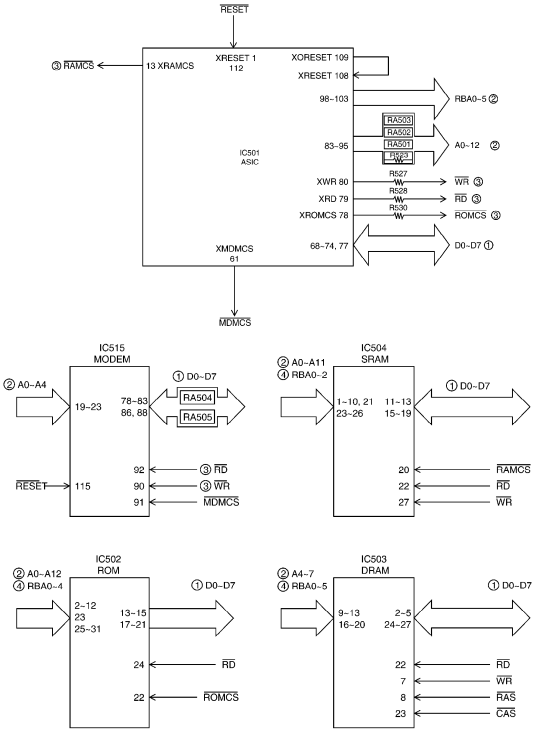


Remarks:
When you use an oscilloscope to judge whether a signal to be tested is normal or NG, perform the signal check in exactly the same order as in [List 1]. (If the ASIC fails to access the ROM, the ASIC cannot access SRAM or DRAM normally.)
The digital circuit actually operates according to the timing combinations of these signals. If the timing of these signals is even slightly delayed, the circuit will not work. Nor will it if the IC is defective and the output voltage level is not normal although the timing of these signals is accurate enough to meet the specifications. (Make sure that your oscilloscope is calibrated before starting a test.)
Therefore, it is imperative to confirm whether each IC outputs the signal at the correct level.

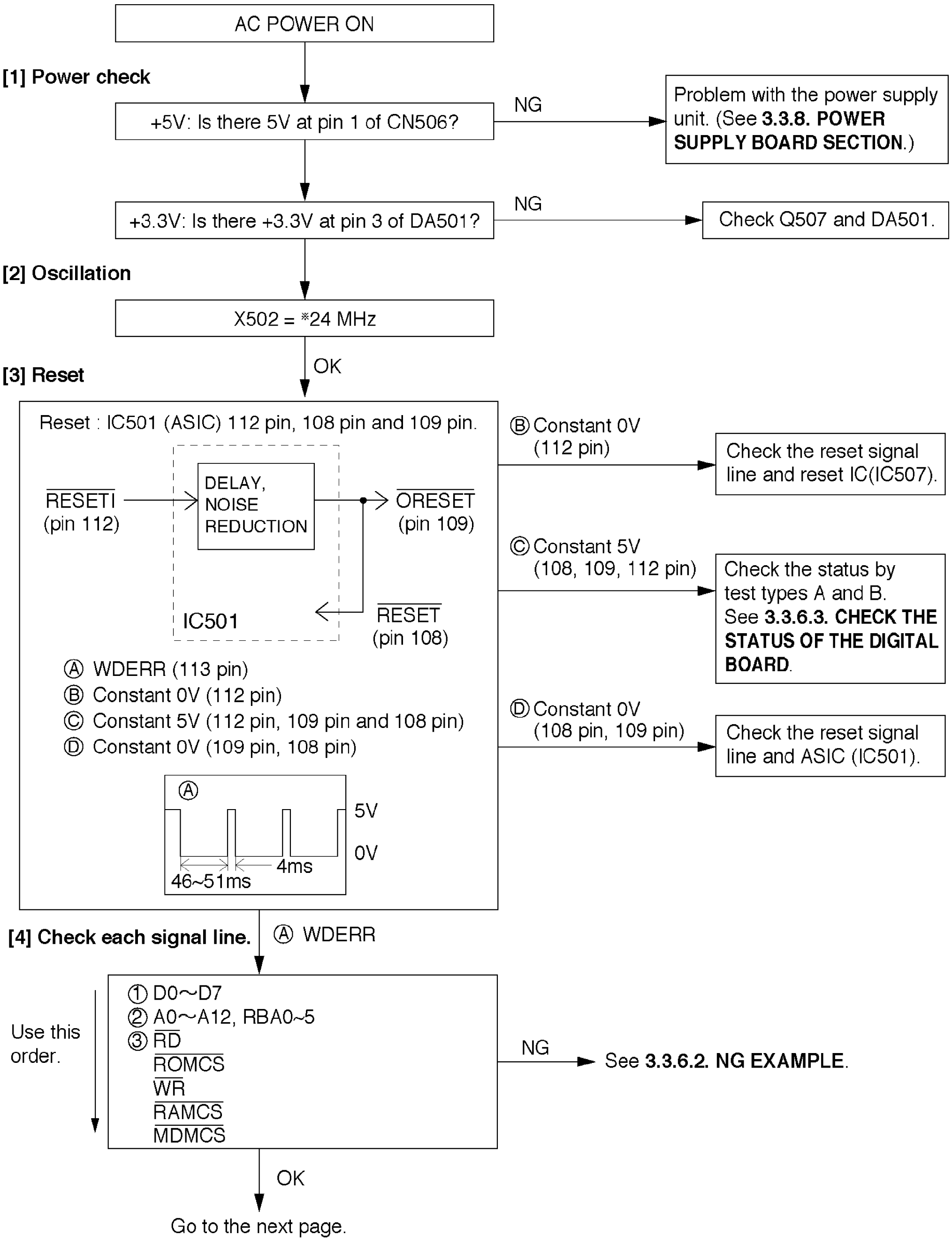
(See the I/O Pin No. Diagram.) The signal level should be constantly output at between 5V (H) and 0V (L) as described earlier.

Note:
Simply check the output level and make sure if the IC repeatedly outputs the signal at between 5V (H) and 0V (L).

I/O and Pin No. Diagram


RESET
③ RAMCS
13 XRAMCS
XRESET 1
112
XORESET 109
XRESET 108
98~103
RBA0~5 ②
RA503
RA502
RA501
R523
83~95
A0~12 ②
IC501
ASIC
XWR 80
R527
WR ③
XRD 79
R528
RD ③
XROMCS 78
R530
ROMCS ③
68~74, 77
D0~D7 ①
XMDMCS
61
MDMCS
IC515
MODEM
② A0~A4
19~23
78~83
86, 88
① D0~D7
RA504
RA505
92
③ RD
RESET
115
90
③ WR
91
MDMCS
IC504
SRAM
② A0~A11
④ RBA0~2
1~10, 21
23~26
11~13
15~19
① D0~D7
20
RAMCS
22
RD
27
WR
IC502
ROM
② A0~A12
④ RBA0~4
2~12
23
25~31
13~15
17~21
① D0~D7
24
RD
22
ROMCS
IC503
DRAM
② A4~7
④ RBA0~5
9~13
16~20
2~5
24~27
① D0~D7
22
RD
7
WR
8
RAS
23
CAS

After the power is turned on, the ASIC initializes and checks each IC.
The ROM, SRAM, and modem are checked.
If initialization fails for the ICs , the system will not boot up.
In this case, please find the cause as follows.

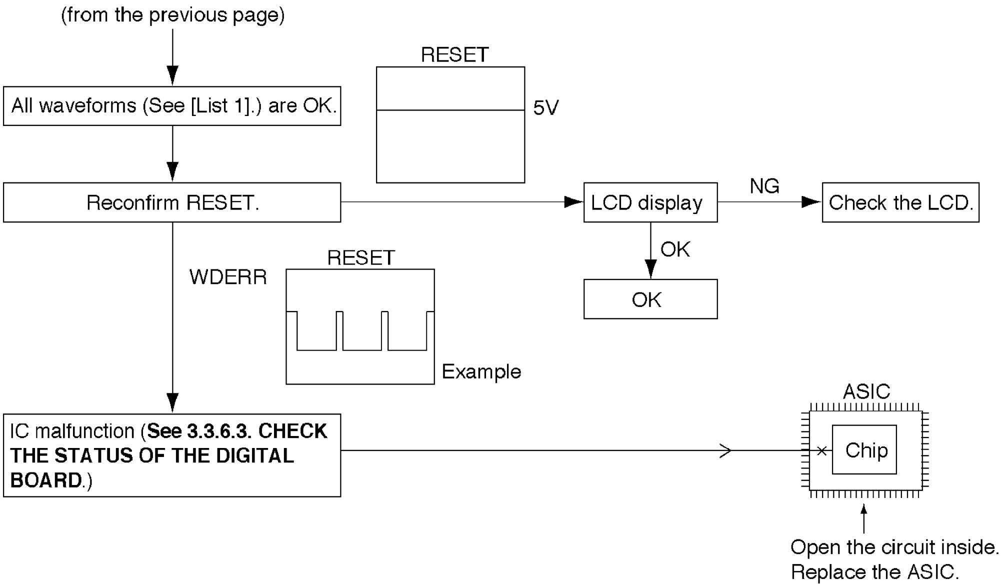

AC POWER ON
[1] Power check
+5V: Is there 5V at pin 1 of CN506?
NG
Problem with the power supply unit. (See 3.3.8. POWER SUPPLY BOARD SECTION.)
+3.3V: Is there +3.3V at pin 3 of DA501?
NG
Check Q507 and DA501.
[2] Oscillation
X502 = *24 MHz
[3] Reset
OK
Reset : IC501 (ASIC) 112 pin, 108 pin and 109 pin.
RESETI
(pin 112)
DELAY, NOISE REDUCTION
ORESET
(pin 109)
IC501
RESET
(pin 108)
Ⓐ WDERR (113 pin)
Ⓑ Constant 0V (112 pin)
Ⓒ Constant 5V (112 pin, 109 pin and 108 pin)
Ⓓ Constant 0V (109 pin, 108 pin)
Ⓐ
5V
0V
4ms
46~51ms
Ⓑ Constant 0V (112 pin)
Check the reset signal line and reset IC(IC507).
Ⓒ Constant 5V (108, 109, 112 pin)
Check the status by test types A and B. See 3.3.6.3. CHECK THE STATUS OF THE DIGITAL BOARD.
Ⓓ Constant 0V (108 pin, 109 pin)
Check the reset signal line and ASIC (IC501).
[4] Check each signal line.
Ⓐ WDERR
Use this order.
① D0~D7
② A0~A12, RBA0~5
③ RD
ROMCS
WR
RAMCS
MDMCS
NG
See 3.3.6.2. NG EXAMPLE.
OK
Go to the next page.

CROSS REFERENCE:

NG EXAMPLE()

CHECK THE STATUS OF THE DIGITAL BOARD()

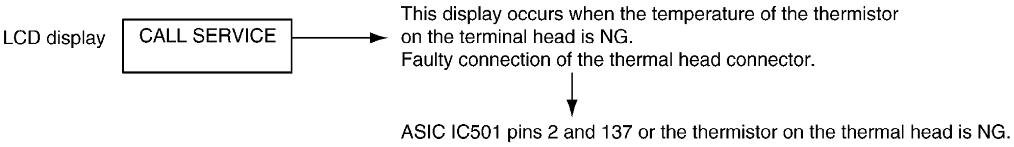
POWER SUPPLY BOARD SECTION()


(from the previous page)
All waveforms (See [List 1].) are OK.
RESET
5V
Reconfirm RESET.
LCD display
NG
Check the LCD.
OK
OK
WDERR
RESET
Example
ASIC
Chip
IC malfunction (See 3.3.6.3. CHECK THE STATUS OF THE DIGITAL BOARD.)
Open the circuit inside.
Replace the ASIC.

CROSS REFERENCE:

CHECK THE STATUS OF THE DIGITAL BOARD()

Other NG example while the power is ON and the LCD displays the following.


LCD display
CALL SERVICE

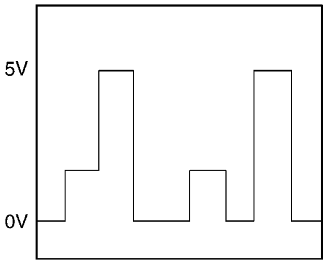
This display occurs when the temperature of the thermistor on the terminal head is NG.
Faulty connection of the thermal head connector.

ASIC IC501 pins 2 and 137 or the thermistor on the thermal head is NG.

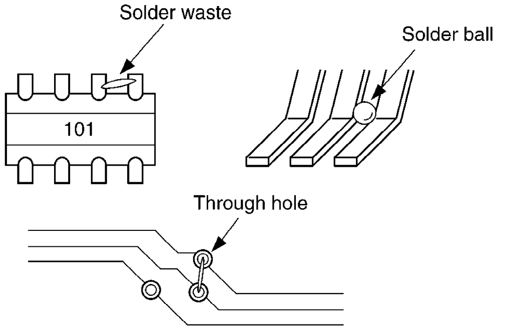
Refer to LCD MESSAGES ()

3.3.6.2. NG EXAMPLE

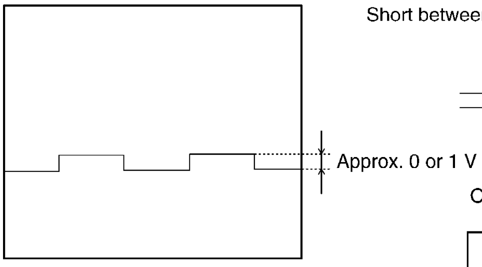
1.



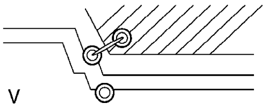
Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.


Solder waste
Solder ball
101
Through hole

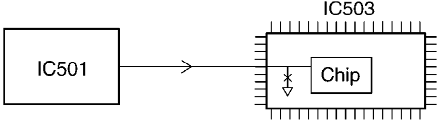
2.



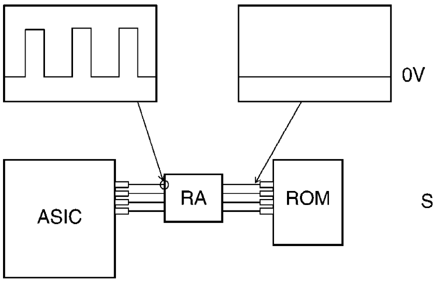
Short between the signal line and GND.



OR IC malfunction


IC503
IC501
Chip

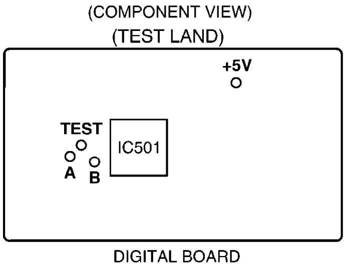
3.

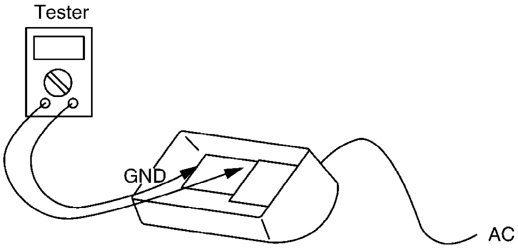

0V
ASIC
RA
ROM

Solder fault on RA.

3.3.6.3. CHECK THE STATUS OF THE DIGITAL BOARD

Please check the status (voltage) of test lands **A** and **B**.
The result may tell you a defective point.





- Turn off the power supply.
- Short using a metallic object, such as tweezers, between the **TEST** point and **+5V** land, and turn on the AC power for a few seconds. And then remove a metallic object.
- Check the following voltages using an oscilloscope or tester.
- To cancel the status check mode, turn off the AC power.

Defective point	Check point voltage		Check items
	A	B	
RTC (IC501)	0V	0V	IC501(RTC is included in IC501)
DRAM (IC503)	0V	5V	IC503(8,23 pin), R550, R552, R556, R557, IC501(64, 65 pin)
MODEM (IC515)	5V	0V	IC501(61 pin), IC515(90~92 pin), R559, L517, C552, R561, C550, RA504, RA505
ALL OK	5V	5V	

- This indicates that the Add/Data Bus, RAM, ROM, MODEM, and ASIC are all connected to the ASIC properly and that control from the ASIC is possible.

Please check the soldering and conduction of these components.
If there is no problem, replace the ICs.

If you still have a problem with the digital board, please refer to **NG wave pattern**.

3.3.7. ANALOGUE BOARD SECTION

This chapter provides the testing procedures required for the analog parts. A signal route to be tested is determined depending upon purposes. For example, the handset TX route begins at the handset microphone and the signal is output to the telephone line. The signal mainly flowing on this route is analogue. You can trace the signal with an oscilloscope. The signal flow on each route is shown in the Check Sheet here. If you find a specific problem in the unit, for example if you cannot communicate with the H/S, trace that signal route locally with the following Check Sheet and locate the faulty point.

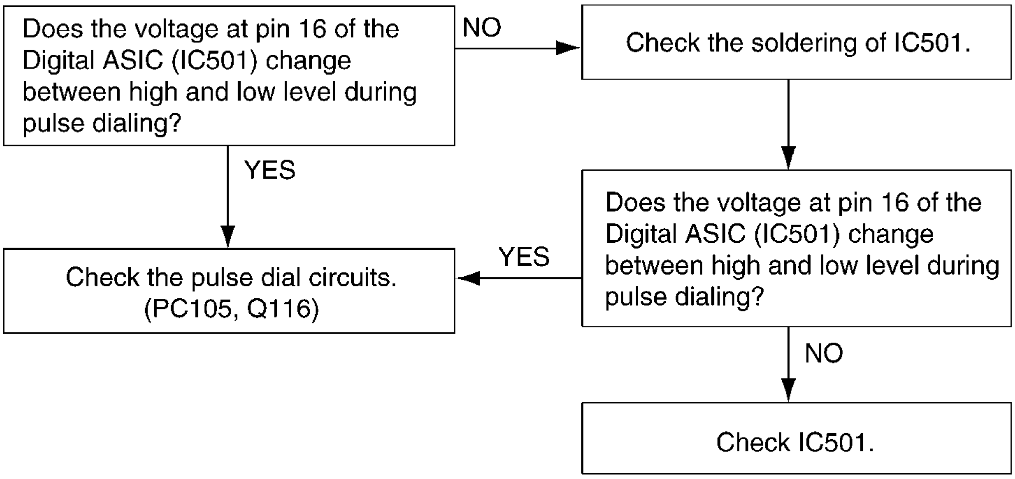
3.3.7.1. CHECK SHEET

(SYMPTOM) ITEMS TO CHECK		IN —signal→ ROUTE → OUT
MONITOR		TEL LINE-T101-C129-C121-IC101(2)(1)- J103-C113-CN101(8)-{CN501(8)-C584-R631-IC514(23)(34)-R644-C636-IC501(34)(33)-R635-R636-C570-IC514(32)(35)-CN501(10)}-CN101(10)-C161-R164-IC102(4-5,8)-CN105(1,2)-SPEAKER
HS TX		HS MIC-CN104(4)-FLT103-L129-L111-C199-R204 HS MIC-CN104(1)-FLT103-L126-L108-C200-R207 -IC106(2,3-1)-FLT105-R223-J152-FLT106-L121-CN101(11)-{CN501(11)-L527-LFT104-R633-C587-R638-IC514(15)-IC514(22)-R639-CN501(9)}-CN101(9)-C110-R108-R112-IC101(6)(7)-C136-R138-R137-T101-TEL LINE
HS RX		TEL LINE-T101-C129-C121-IC101(2)(1)- J103 -C113-CN101(8)-{CN501(8)-C584-R631-IC514(23)(34)-R644-C636-IC501(34)(33)-R635-R636-C570-IC514(32)(10)-R637-LFT104-CN501(14)}-CN101(14)-L122-FLT106-L125-R187-C176-IC107(3)(4)-L116-C185-FLT105-L123-R198-IC106(6)(7)-C197-R206-Q117-C212-L109-L127-FLT103-CN104(2)-HS SPEAKER
DTMF MONITOR	SP	{IC515(69)-C586-R574-IC514(24)(34)-R644-C636-IC501(34)(33)-R635-R636-C570-IC514(32)(35)-CN501(10)}-CN101(10)-C161-R164-IC102(4-5)(8)-CN105(1,2)-SPEAKER
	HS	IC515(69)-C586-R574-IC514(24)(34)-R644-C636-IC501(34)(33)-R635-R636-C570-IC514(32)(10)-R637-LFT104-CN501(14)}-CN101(14)-L122-FLT106-L125-R187-C176-IC107(3)(4)-L116-C185-FLT105-L123-R198-IC106(6)(7)-C197-R206-Q117-C212-L109-L127-FLT103-CN104(2)-HS SPEAKER
DTMF for TEL Line FAX TX		{IC515(69)-C586-R574-IC514(24)(22)-R639-CN501(9)}-CN101(9)-C110-R108-R112-IC101(6)(7)-C136-R138-R137-T101-TEL LINE
Dummy Ring Back Tone		{IC501(30)-R628-C615-R605-IC514(27)(22)-R639-CN501(9)}-CN101(9)-C110-R108-R112-IC101(6)(7)-C136-R138-R137-T101-TEL LINE
Ringing/Alarm/ Beep/Key Tones		{IC501(30)-R628-C615-R605-IC514(27)(34)-R644-C636-IC501(34)(33)-R635-R636-C570-IC514(32)(35)-CN501(10)}-CN101(10)-C161-R164-IC102(4-5,8)-CN105(1)(2)-SPEAKER
CNG Detection		TEL LINE-T102-CN106(3)}-CN507(3)-R692-R640-C630-R581- IC514(20)(31) -R676-C663-IC515(60)}
FAX RX		TEL LINE-T101-C129-C121-IC101(2)(1)- J103 -C113-CN101(8)-{CN501(8)-C584-R631-IC514(23)(31)-R676-C663-IC515(60)}
CALLER ID		TEL LINE-T102-CN106(3)}-CN507(3)-R692-R640-C630-R581-IC514(20)(31)-R675-C664-IC515(62)

Note:
{ }: Inside the digital board
[ ]: Inside the operation board

3.3.7.2. DEFECTIVE ITS (Integrated Telephone System) SECTION

1. **No handset and speakerphone transmission / reception**
   Perform a signal test in the ITS or the NCU section and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. CHECK SHEET() is useful for this investigation.
2. **No pulse dialing**



Does the voltage at pin 16 of the Digital ASIC (IC501) change between high and low level during pulse dialing?

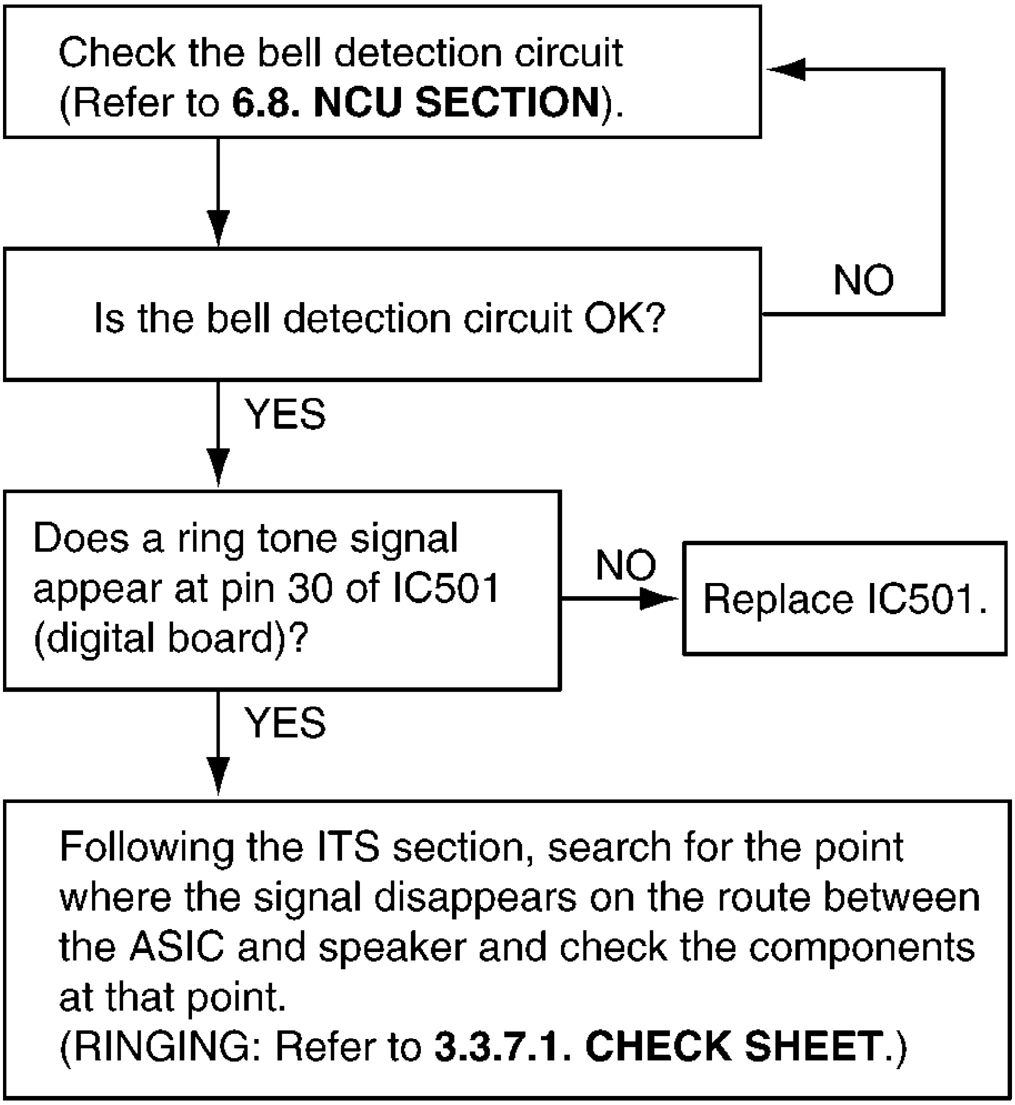
Check the soldering of IC501.

Check the pulse dial circuits. (PC105, Q116)

Does the voltage at pin 16 of the Digital ASIC (IC501) change between high and low level during pulse dialing?

Check IC501.

3. No ring tone (or No bell)



Check the bell detection circuit (Refer to **6.8. NCU SECTION**).

Is the bell detection circuit OK?

Does a ring tone signal appear at pin 30 of IC501 (digital board)?

Replace IC501.

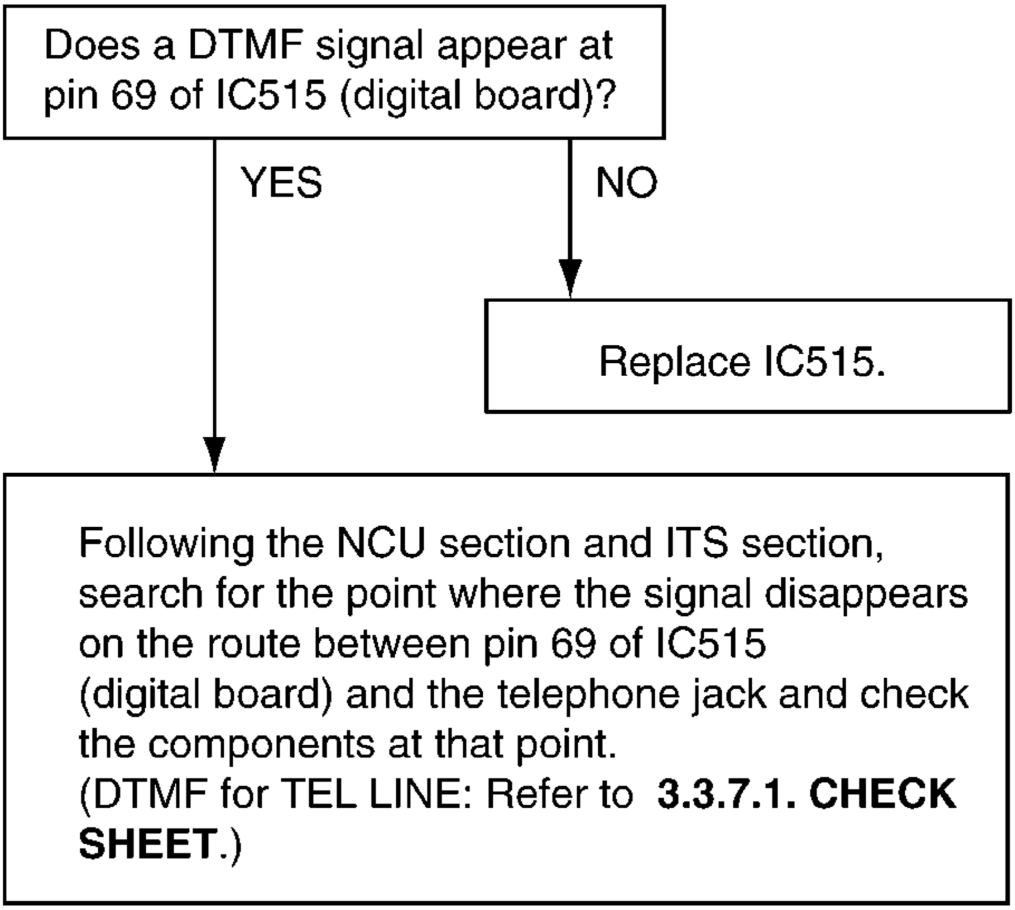
Following the ITS section, search for the point where the signal disappears on the route between the ASIC and speaker and check the components at that point.
(RINGING: Refer to **3.3.7.1. CHECK SHEET**.)

CROSS REFERENCE:

CHECK SHEET()

NCU SECTION()

4. No tone dialing



Does a DTMF signal appear at pin 69 of IC515 (digital board)?

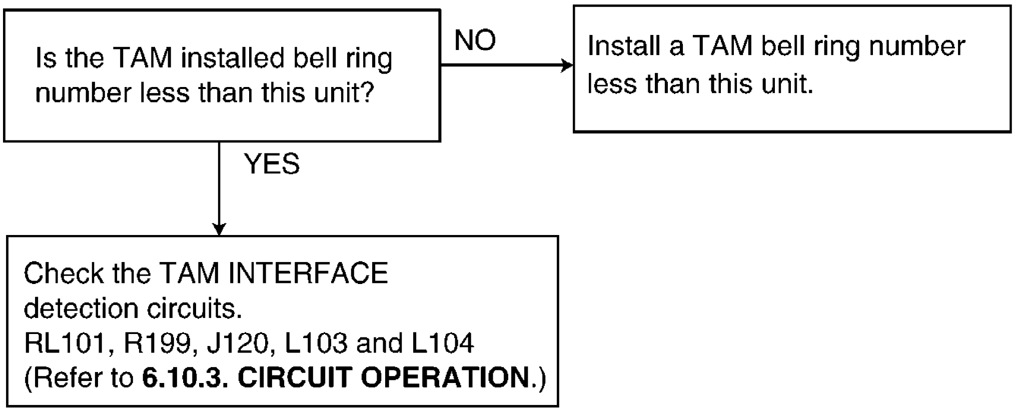
Replace IC515.

Following the NCU section and ITS section, search for the point where the signal disappears on the route between pin 69 of IC515 (digital board) and the telephone jack and check the components at that point.
(DTMF for TEL LINE: Refer to **3.3.7.1. CHECK SHEET**.)

CROSS REFERENCE:
CHECK SHEET()

3.3.7.3. DETECTIVE TAM INTERFACE SECTION

1. The FAX turns on, but does not arrive through TAM.



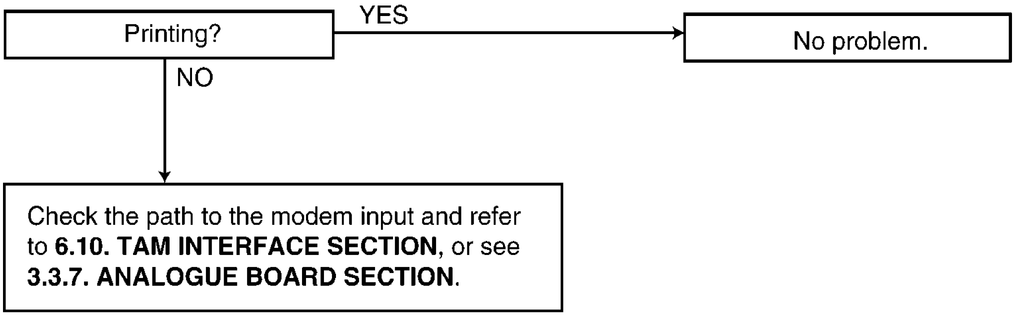
Is the TAM installed bell ring number less than this unit?

Install a TAM bell ring number less than this unit.

Check the TAM INTERFACE detection circuits.
RL101, R199, J120, L103 and L104
(Refer to **6.10.3. CIRCUIT OPERATION**.)

CROSS REFERENCE:
CIRCUIT OPERATION()

2. A FAX is received, but won't switch from TAM to FAX.


Printing?
YES
No problem.
NO
Check the path to the modem input and refer to **6.10. TAM INTERFACE SECTION**, or see **3.3.7. ANALOGUE BOARD SECTION**.

CROSS REFERENCE:
ANALOGUE BOARD SECTION()
TAM INTERFACE SECTION()

3.3.8. POWER SUPPLY BOARD SECTION

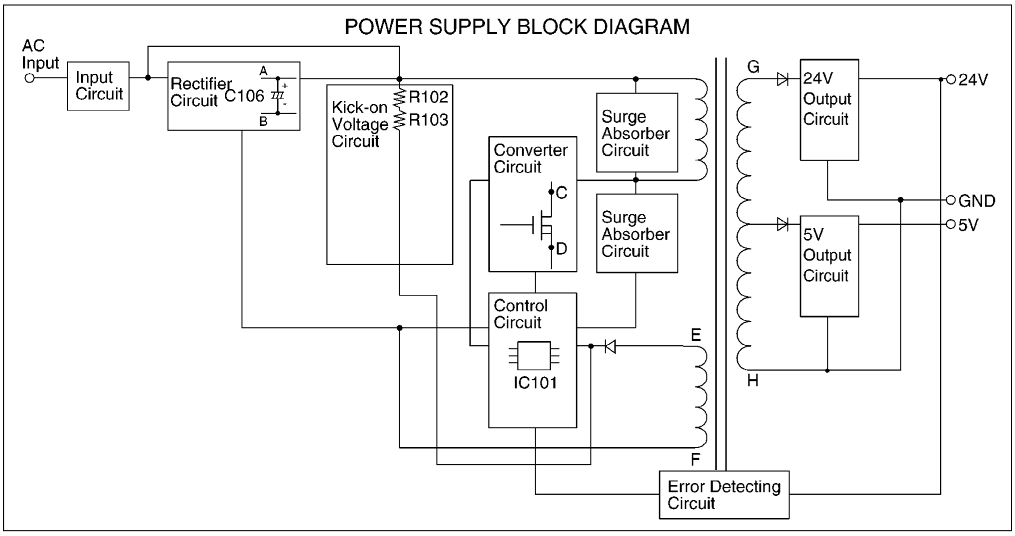
3.3.8.1. KEY COMPONENTS FOR TROUBLESHOOTING

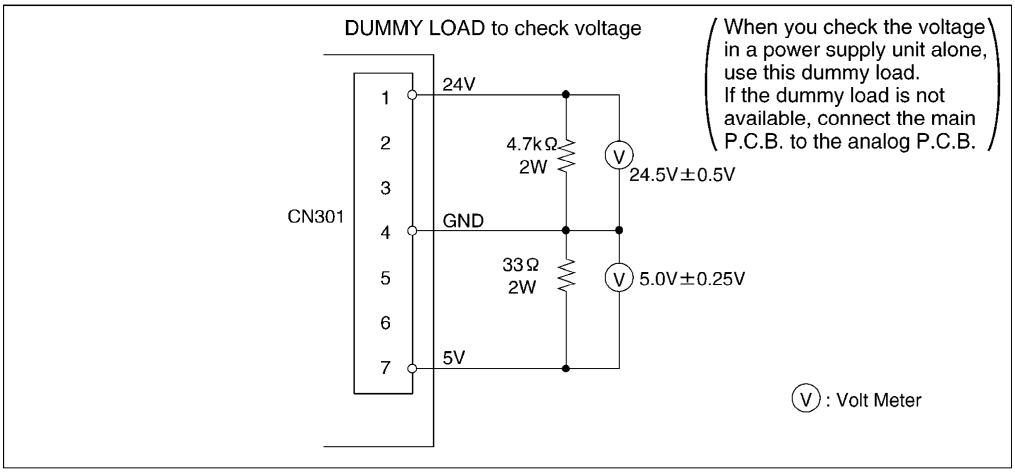
Check the following parts first: F101, D101-D104, C106, Q101, PC101 and IC101.
This comes from our experience with experimental tests. For example: power supply and lightning surge voltage test, withstanding voltage test, intentional short circuit test, etc.

Caution:

If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

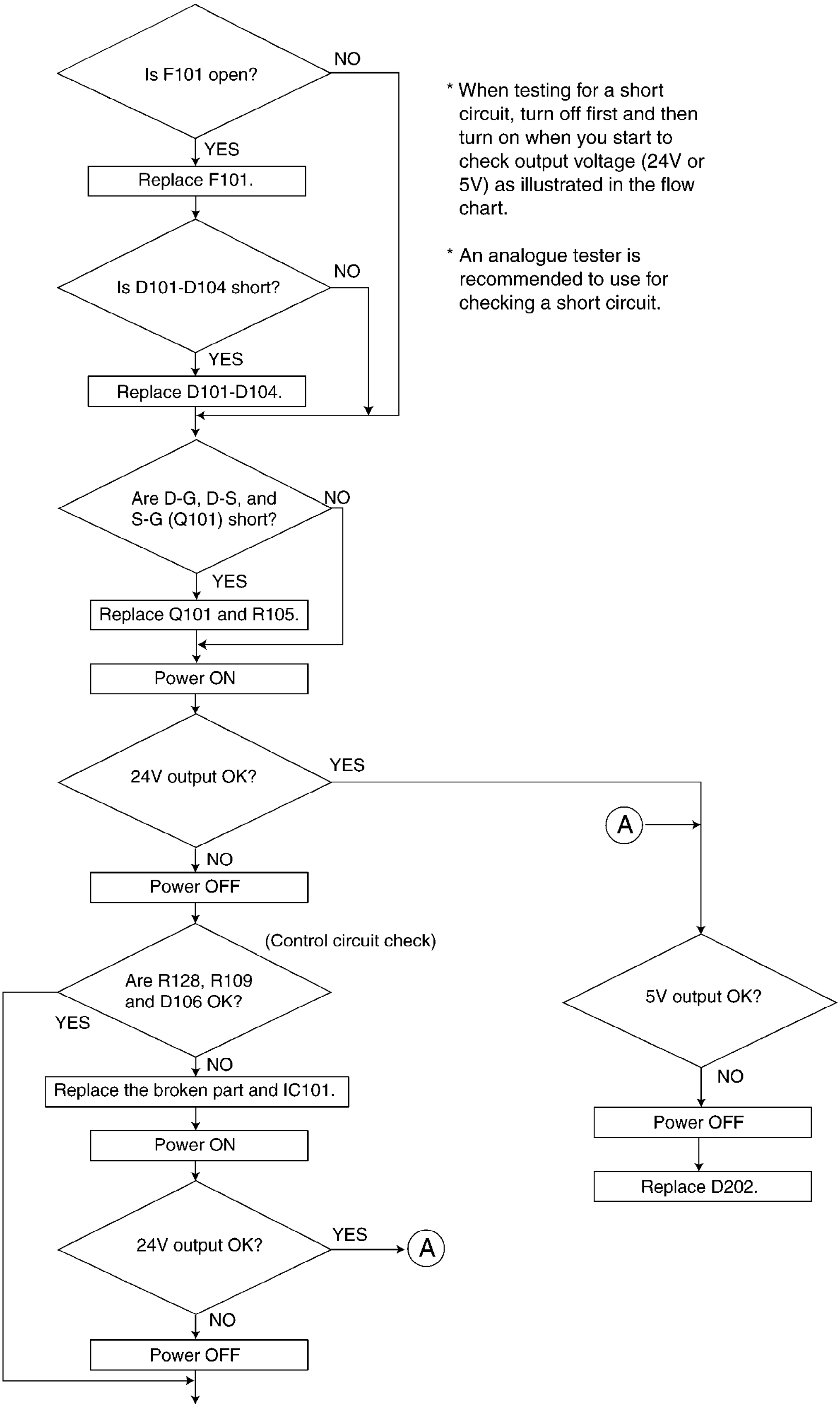
In most cases, the symptom is that nothing is output. It is more likely that the fault is in the primary side rather than the secondary side. Check the primary side first.


POWER SUPPLY BLOCK DIAGRAM
AC Input
Input Circuit
Rectifier Circuit
C106
A
B
Kick-on Voltage Circuit
R102
R103
Converter Circuit
C
D
Surge Absorber Circuit
Surge Absorber Circuit
Control Circuit
IC101
E
F
G
H
24V Output Circuit
5V Output Circuit
24V
GND
5V
Error Detecting Circuit


DUMMY LOAD to check voltage
CN301
1
2
3
4
5
6
7
24V
GND
5V
4.7kΩ 2W
33Ω 2W
24.5V±0.5V
5.0V±0.25V
V : Volt Meter

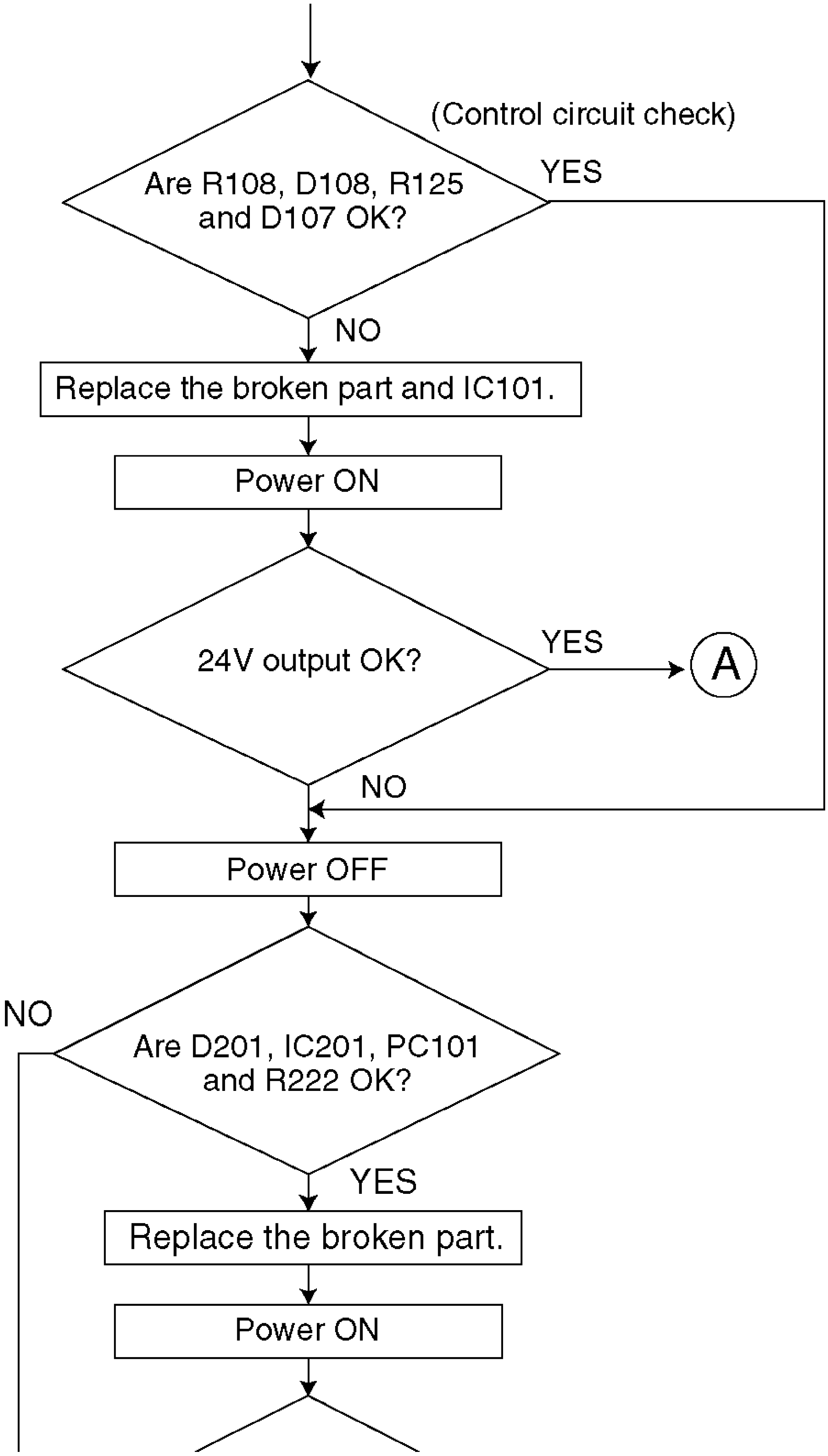
(When you check the voltage in a power supply unit alone, use this dummy load.
If the dummy load is not available, connect the main P.C.B. to the analog P.C.B.)

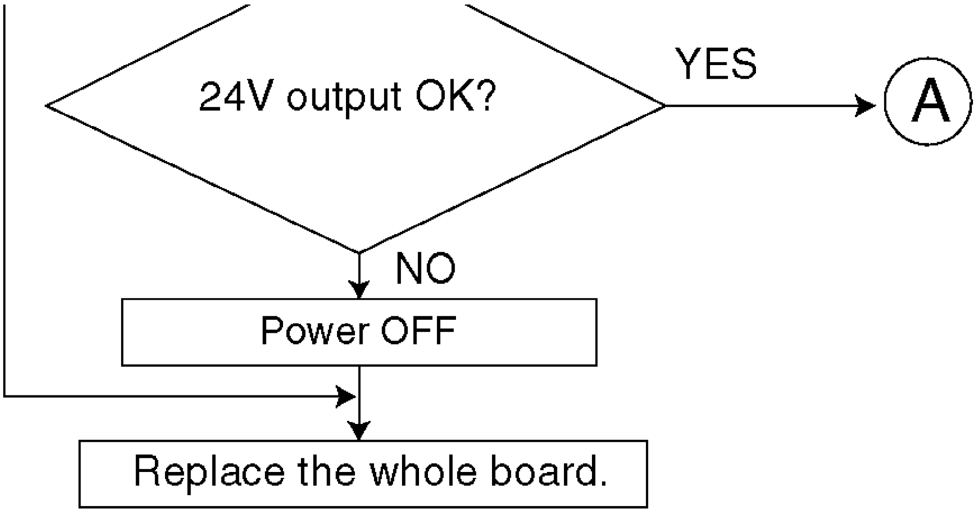
3.3.8.2. TOROUBLESHOOTING FLOW CHART


Is F101 open?
NO
YES
Replace F101.
Is D101-D104 short?
NO
YES
Replace D101-D104.
Are D-G, D-S, and S-G (Q101) short?
NO
YES
Replace Q101 and R105.
Power ON
24V output OK?
YES
NO
Power OFF
(Control circuit check)
Are R128, R109 and D106 OK?
YES
NO
Replace the broken part and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
A
5V output OK?
NO
Power OFF
Replace D202.

* When testing for a short circuit, turn off first and then turn on when you start to check output voltage (24V or 5V) as illustrated in the flow chart.

* An analogue tester is recommended to use for checking a short circuit.


(Control circuit check)
Are R108, D108, R125 and D107 OK?
YES
NO
Replace the broken part and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
NO
Are D201, IC201, PC101 and R222 OK?
YES
Replace the broken part.
Power ON


24V output OK?
YES
A
NO
Power OFF
Replace the whole board.

3.3.8.3. BROKEN PARTS REPAIR DETAILS

(D101, D102, D103, D104)

Check for a short-circuit in terminal 4. If D101, D102, D103 and D104 are short-circuits, F101 will melt (open).

In this case, replace all of the parts (D101, D102, D103, D104, F101).

(Q101)

The worst case of Q101 is a short-circuit between the Drain and Gate because damage expands to the peripheral circuit of Q101.

This is due to a very high voltage through the Gate circuit which is composed of R128, R109, D106 and IC101.

You should change all of the parts listed as follows.

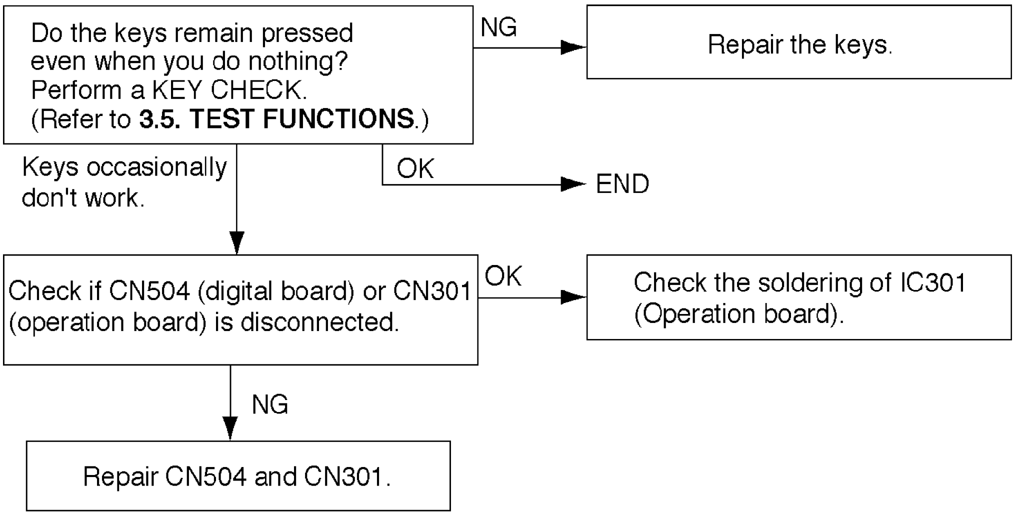
F101, Q101, R128, R109, D106, IC101

(D201)

If D201 is broken, the oscillation circuit in the power supply cannot operate. Check it with an electric tester.

3.3.9. OPERATION PANEL SECTION

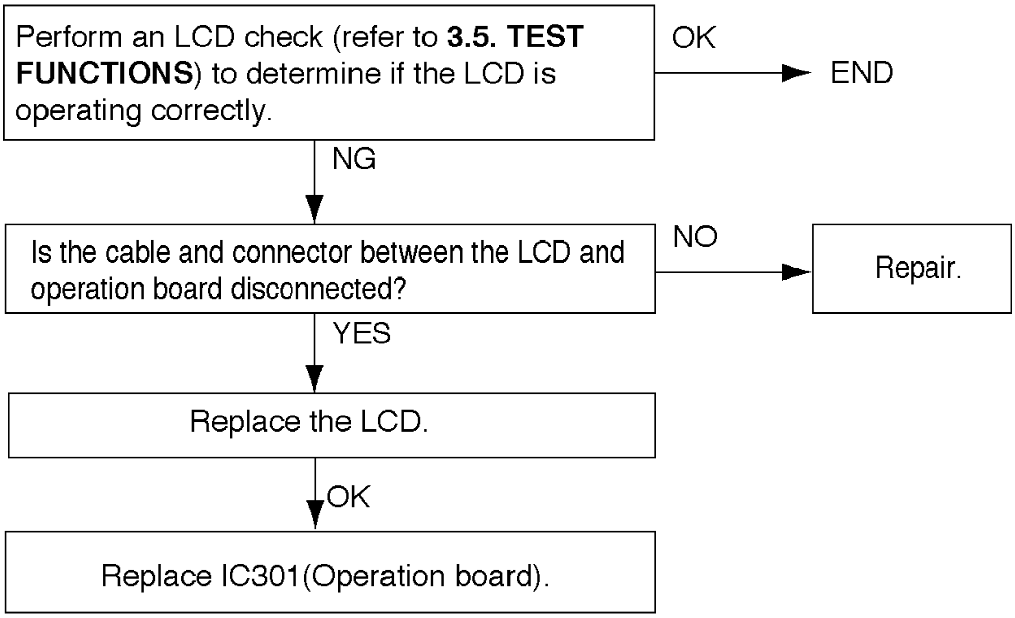
3.3.9.1. NO KEY OPERATION


Do the keys remain pressed
even when you do nothing?
Perform a KEY CHECK.
(Refer to 3.5. TEST FUNCTIONS.)
NG
Repair the keys.
Keys occasionally
don't work.
OK
END
Check if CN504 (digital board) or CN301
(operation board) is disconnected.
OK
Check the soldering of IC301
(Operation board).
NG
Repair CN504 and CN301.

CROSS REFERENCE:

TEST FUNCTIONS()

3.3.9.2. NO LCD INDICATION


Perform an LCD check (refer to 3.5. TEST FUNCTIONS) to determine if the LCD is operating correctly.
OK
END
NG
Is the cable and connector between the LCD and operation board disconnected?
NO
Repair.
YES
Replace the LCD.
OK
Replace IC301(Operation board).

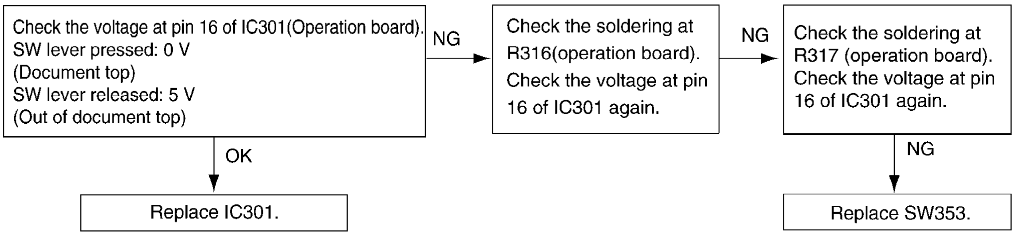
CROSS REFERENCE:
TEST FUNCTIONS()

3.3.10. SENSOR SECTION

Refer to SENSORS AND SWITCHES() for the circuit descriptions.
The Test Function makes the sensor circuit check easier. (Refer to TEST FUNCTIONS().)
For example, as for "COVER OPEN SENSOR", "CO" is turned ON/OFF on the display when you open or close the front cover. Also, document sensor, read position sensor, recording paper sensor and jam sensor are turned ON/OFF by the copy operation. Therefore, each sensor can be checked for proper mechanical operation.
As for the electric check, check whether each voltage is right or not with following flowchart turning each sensor lever ON/OFF manually.

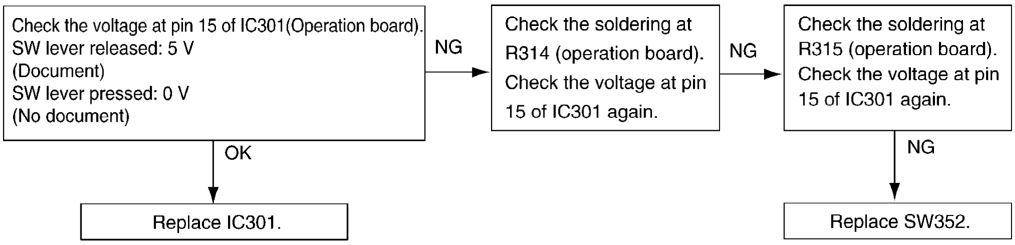
3.3.10.1. CHECK THE DOCUMENT TOP SW (SW353)................."REMOVE DOCUMENT"

Refer to LCD MESSAGES ()


Check the voltage at pin 16 of IC301(Operation board).
SW lever pressed: 0 V
(Document top)
SW lever released: 5 V
(Out of document top)
NG
Check the soldering at R316(operation board). Check the voltage at pin 16 of IC301 again.
NG
Check the soldering at R317 (operation board). Check the voltage at pin 16 of IC301 again.
OK
Replace IC301.
NG
Replace SW353.

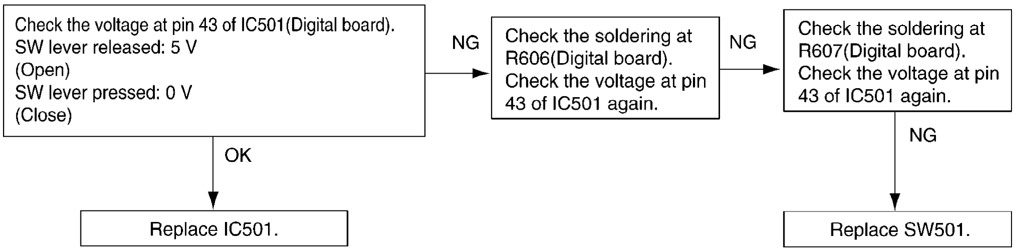
3.3.10.2. CHECK THE DOCUMENT SET SW (SW352)................."CHECK DOCUMENT"

Refer to LCD MESSAGES ()

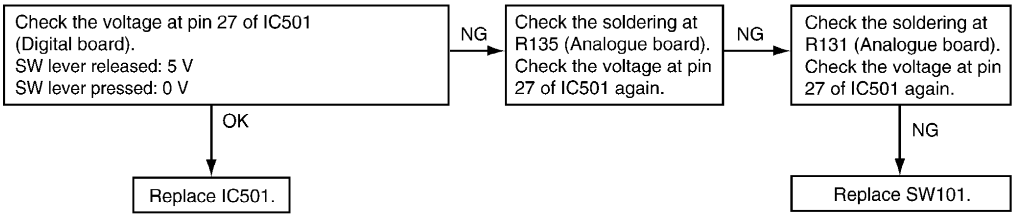

Check the voltage at pin 15 of IC301(Operation board).
SW lever released: 5 V
(Document)
SW lever pressed: 0 V
(No document)
NG
Check the soldering at R314 (operation board). Check the voltage at pin 15 of IC301 again.
NG
Check the soldering at R315 (operation board). Check the voltage at pin 15 of IC301 again.
OK
Replace IC301.
NG
Replace SW352.

3.3.10.3. CHECK THE COVER OPEN AND THE FILM END SW (SW501)................."COVER OPEN or CHECK FILM"

Refer to LCD MESSAGES ()

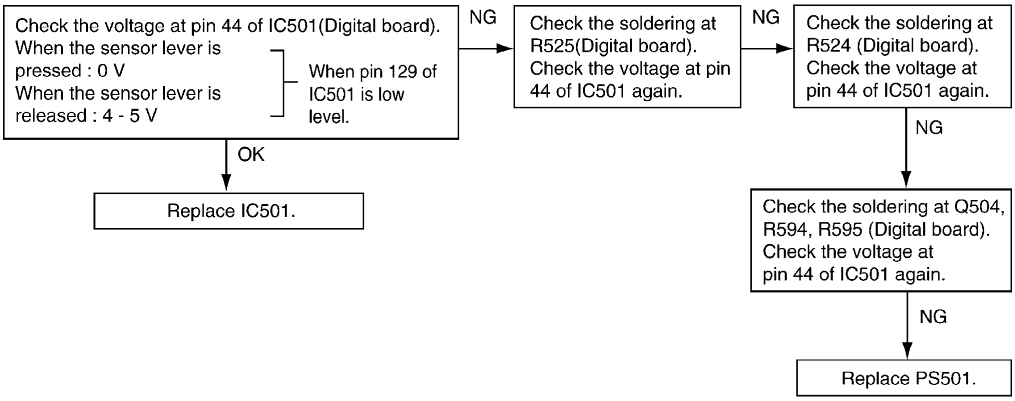

Check the voltage at pin 43 of IC501(Digital board).
SW lever released: 5 V
(Open)
SW lever pressed: 0 V
(Close)
NG
Check the soldering at R606(Digital board). Check the voltage at pin 43 of IC501 again.
NG
Check the soldering at R607(Digital board). Check the voltage at pin 43 of IC501 again.
OK
Replace IC501.
NG
Replace SW501.

3.3.10.4. CHECK THE HOOK SWITCH (SW101)


Check the voltage at pin 27 of IC501 (Digital board).
SW lever released: 5 V
SW lever pressed: 0 V
NG
Check the soldering at R135 (Analogue board). Check the voltage at pin 27 of IC501 again.
NG
Check the soldering at R131 (Analogue board). Check the voltage at pin 27 of IC501 again.
OK
Replace IC501.
NG
Replace SW101.

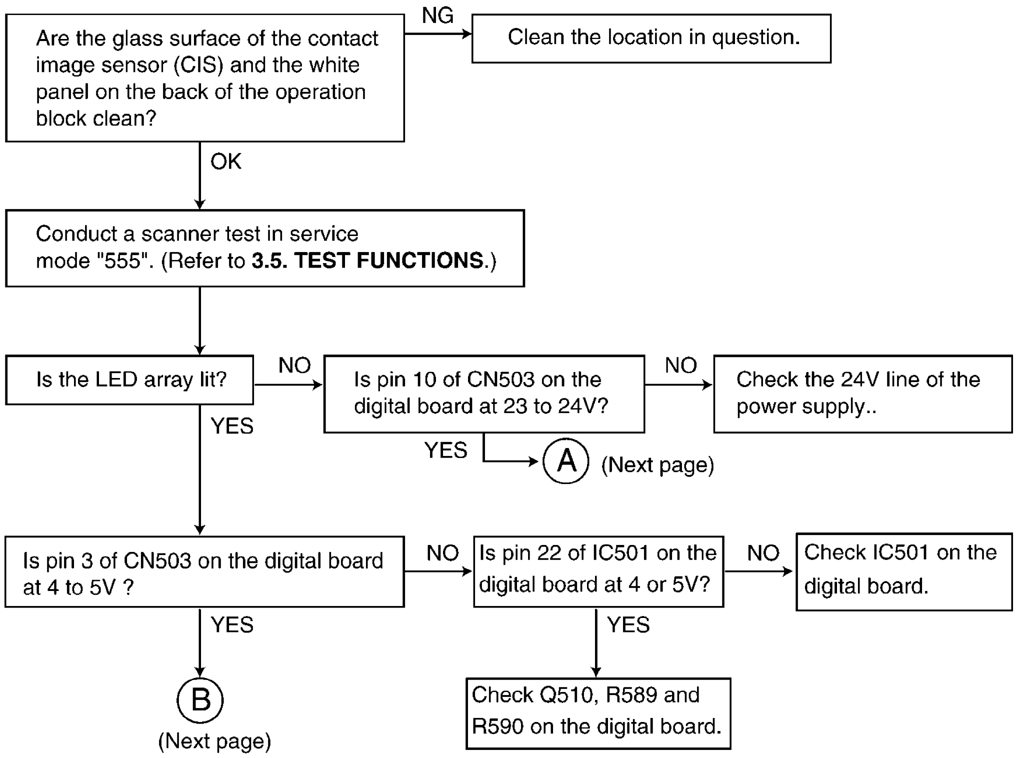
3.3.10.5. CHECK THE PAPER TOP SENSER (PS501)........................"PAPER JAMMED"

Refer to LCD MESSAGES ()


Check the voltage at pin 44 of IC501(Digital board).
When the sensor lever is pressed : 0 V
When the sensor lever is released : 4 - 5 V
When pin 129 of IC501 is low level.
NG
Check the soldering at R525(Digital board). Check the voltage at pin 44 of IC501 again.
NG
Check the soldering at R524 (Digital board). Check the voltage at pin 44 of IC501 again.
OK
Replace IC501.
NG
Check the soldering at Q504, R594, R595 (Digital board). Check the voltage at pin 44 of IC501 again.
NG
Replace PS501.

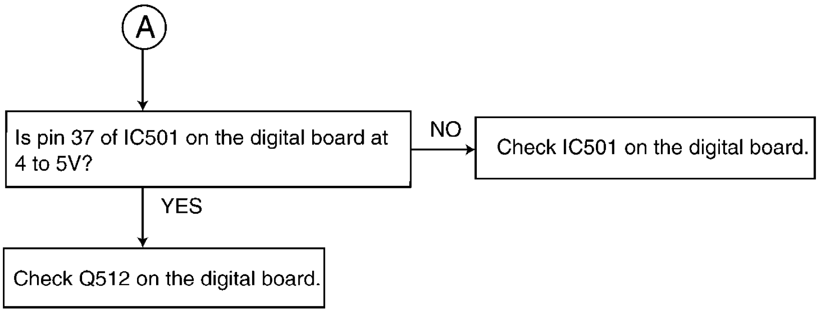
3.3.11. CIS (Contact Image Sensor) SECTION

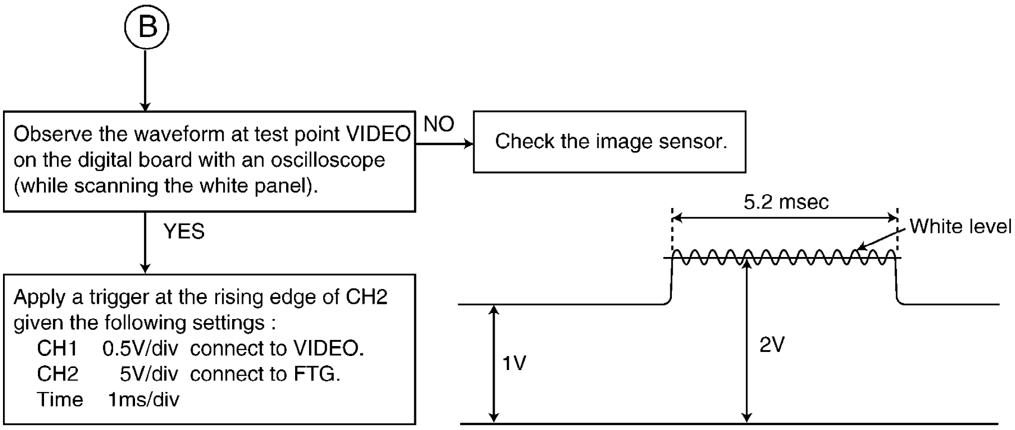
Refer to SCANNING BLOCK().


Are the glass surface of the contact image sensor (CIS) and the white panel on the back of the operation block clean?
NG
Clean the location in question.
OK
Conduct a scanner test in service mode "555". (Refer to **3.5. TEST FUNCTIONS**.)
Is the LED array lit?
NO
Is pin 10 of CN503 on the digital board at 23 to 24V?
NO
Check the 24V line of the power supply..
YES
A
(Next page)
YES
Is pin 3 of CN503 on the digital board at 4 to 5V ?
NO
Is pin 22 of IC501 on the digital board at 4 or 5V?
NO
Check IC501 on the digital board.
YES
B
(Next page)
YES
Check Q510, R589 and R590 on the digital board.

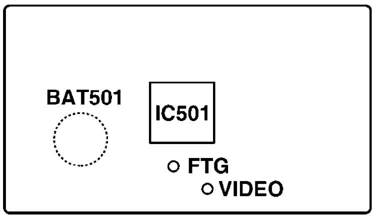
CROSS REFERENCE:

TEST FUNCTIONS()


A
Is pin 37 of IC501 on the digital board at 4 to 5V?
NO
Check IC501 on the digital board.
YES
Check Q512 on the digital board.

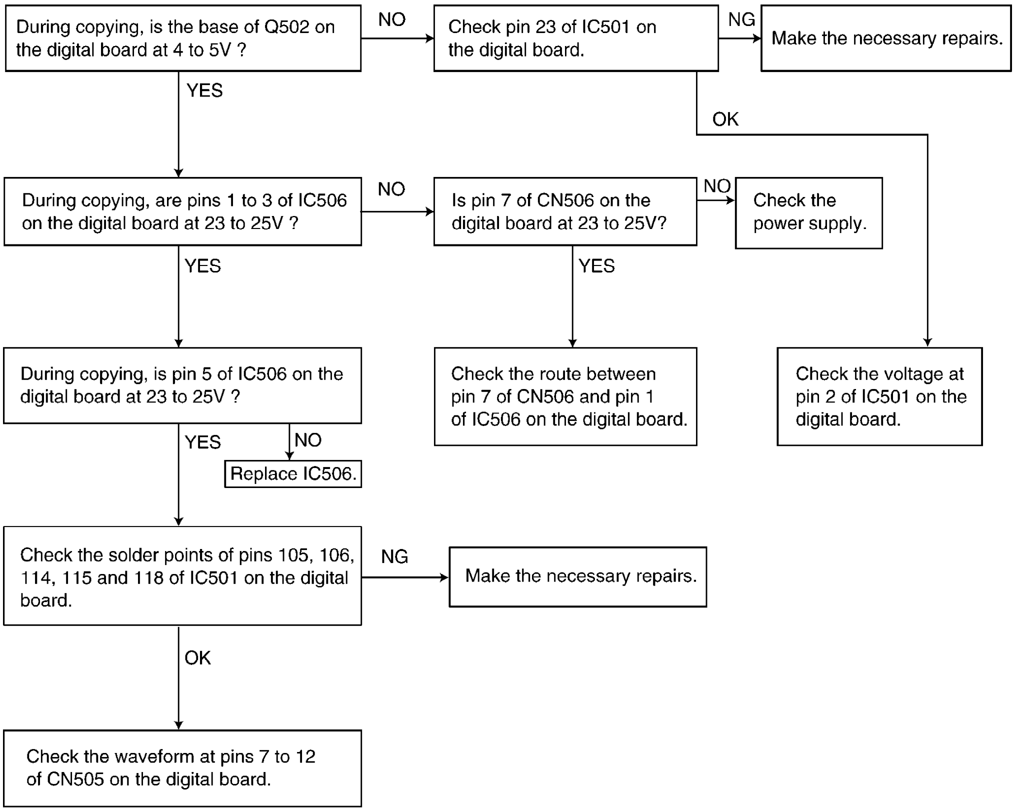

B
Observe the waveform at test point VIDEO on the digital board with an oscilloscope (while scanning the white panel).
NO
Check the image sensor.
YES
Apply a trigger at the rising edge of CH2 given the following settings :
CH1 0.5V/div connect to VIDEO.
CH2 5V/div connect to FTG.
Time 1ms/div
5.2 msec
White level
1V
2V

Digital Board
(Component View)


BAT501
IC501
FTG
VIDEO

3.3.12. THERMAL HEAD SECTION

Refer to THERMAL HEAD().


During copying, is the base of Q502 on the digital board at 4 to 5V ?
NO
Check pin 23 of IC501 on the digital board.
NG
Make the necessary repairs.
OK
YES
During copying, are pins 1 to 3 of IC506 on the digital board at 23 to 25V ?
NO
Is pin 7 of CN506 on the digital board at 23 to 25V?
NO
Check the power supply.
YES
YES
During copying, is pin 5 of IC506 on the digital board at 23 to 25V ?
Check the route between pin 7 of CN506 and pin 1 of IC506 on the digital board.
Check the voltage at pin 2 of IC501 on the digital board.
YES
NO
Replace IC506.
Check the solder points of pins 105, 106, 114, 115 and 118 of IC501 on the digital board.
NG
Make the necessary repairs.
OK
Check the waveform at pins 7 to 12 of CN505 on the digital board.

3.4. PROGRAMMING AND LISTS

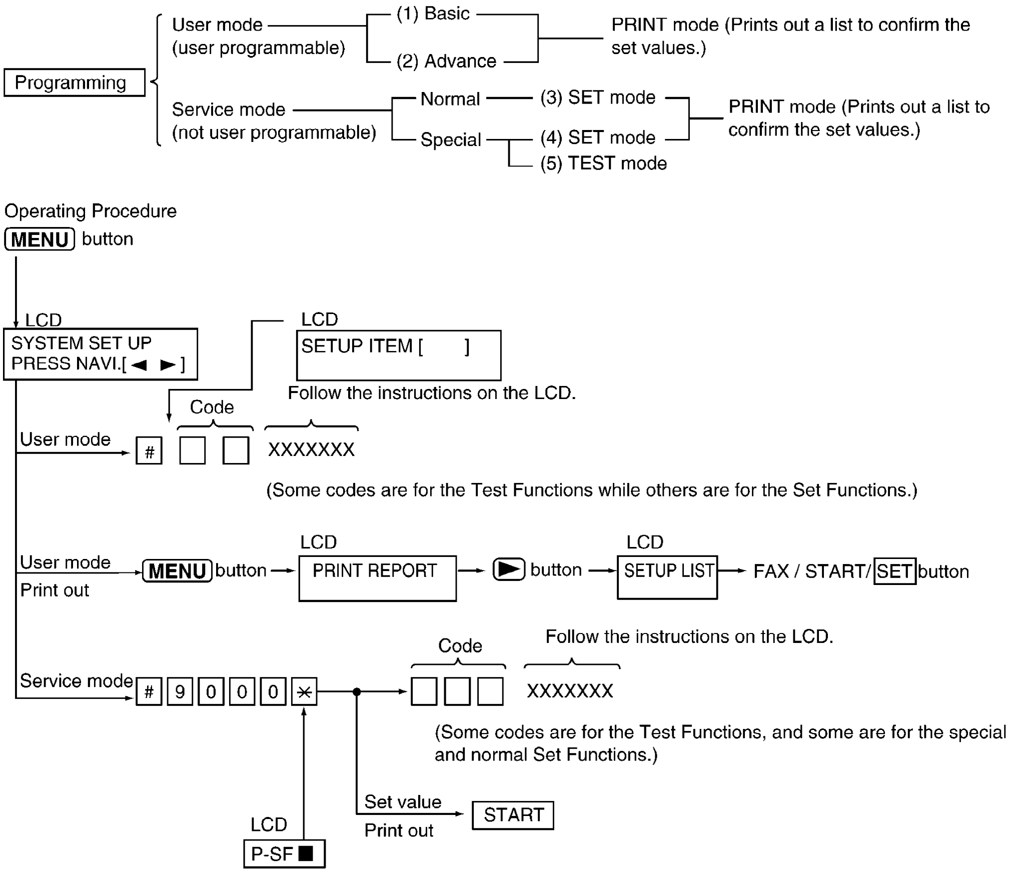
The programming functions are used to program the various features and functions of the machine, and to test the machine.

This facilitates communication between the user and the service man while programming the unit.

3.4.1. OPERATION

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and are available to the user. The special programs are only those listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test the various functions. The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

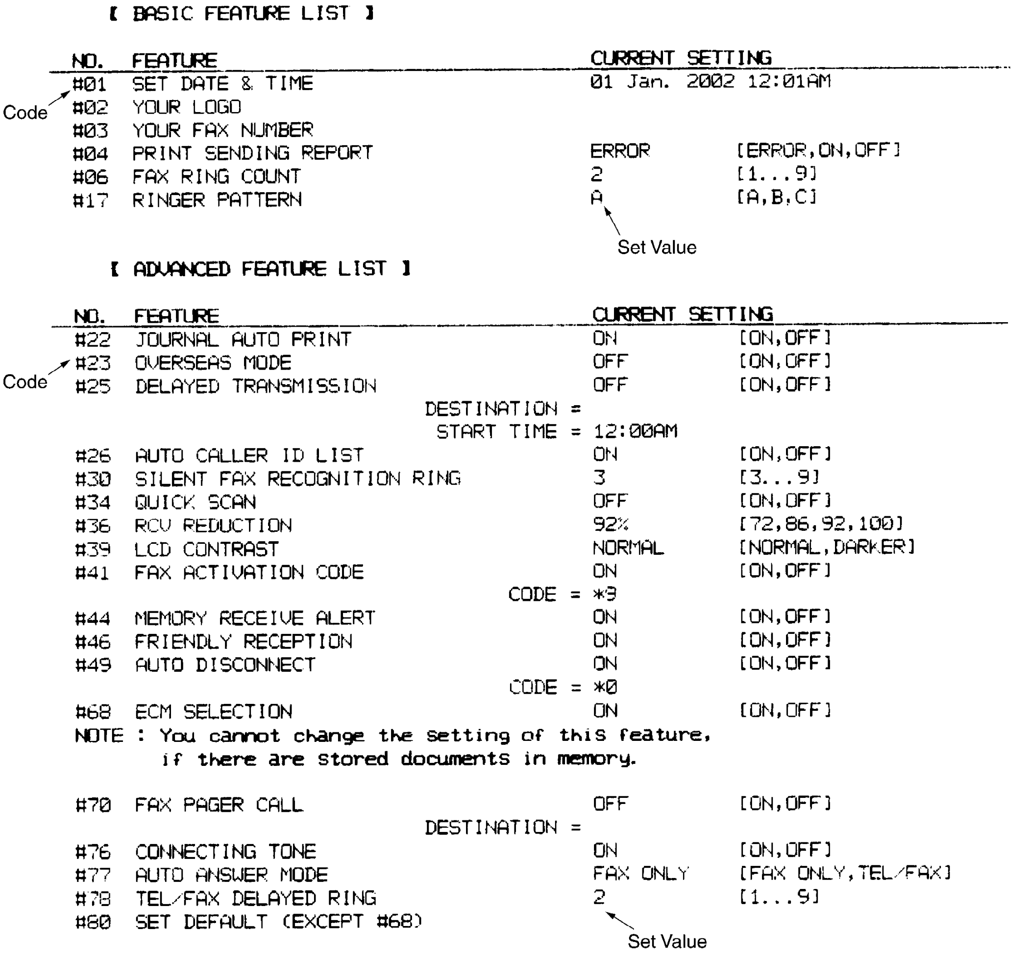
3.4.2. OPERATION FLOW


Programming
User mode
(user programmable)
(1) Basic
(2) Advance
PRINT mode (Prints out a list to confirm the set values.)
Service mode
(not user programmable)
Normal
Special
(3) SET mode
(4) SET mode
(5) TEST mode
PRINT mode (Prints out a list to confirm the set values.)
Operating Procedure
MENU button
LCD
SYSTEM SET UP
PRESS NAVI.[◄ ►]
LCD
SETUP ITEM [ ]
Follow the instructions on the LCD.
Code
User mode
#
XXXXXXX
(Some codes are for the Test Functions while others are for the Set Functions.)
User mode
Print out
MENU button
LCD
PRINT REPORT
► button
LCD
SETUP LIST
FAX / START/SET button
Code
Follow the instructions on the LCD.
Service mode
# 9 0 0 0 ✳
XXXXXXX
(Some codes are for the Test Functions, and some are for the special and normal Set Functions.)
Set value
Print out
START
LCD
P-SF ■

3.4.3. USER MODE (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)

3.4.3.1. KX-FP151E

SETUP LIST


Code
Set Value
Code
Set Value

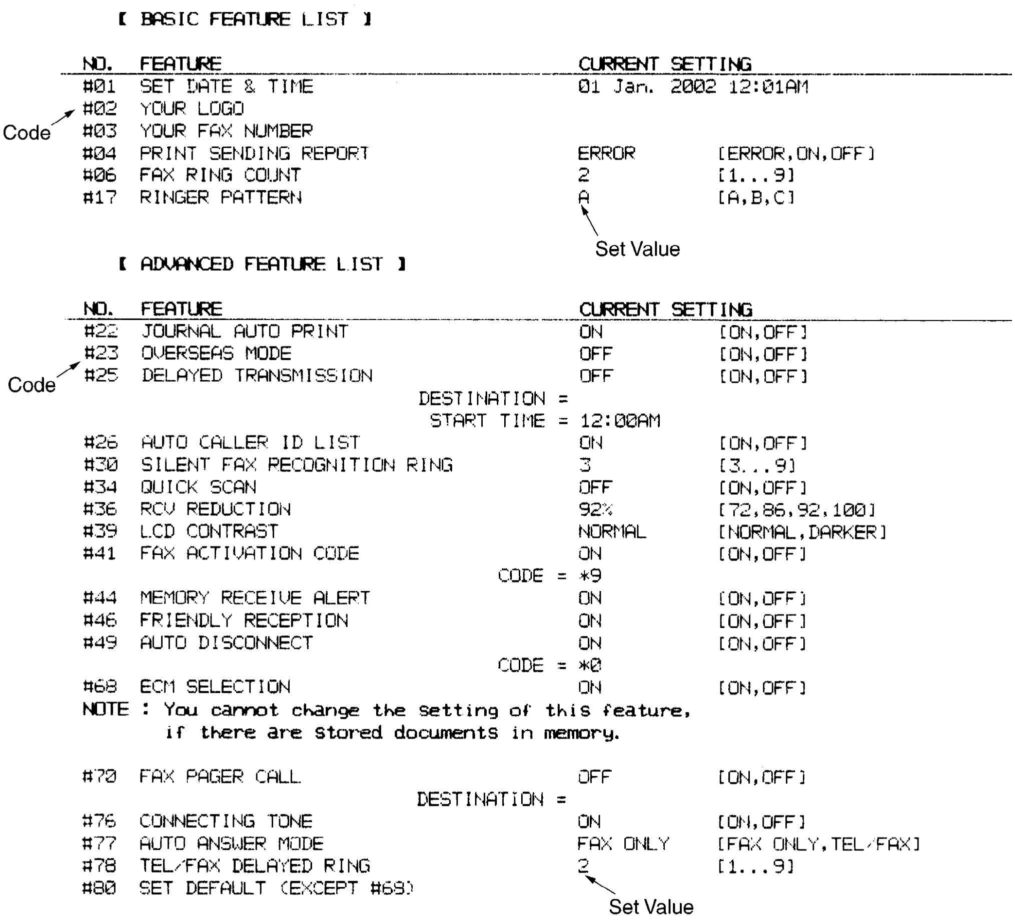
```
  【 BASIC FEATURE LIST 】

 NO.   FEATURE                                   CURRENT SETTING
 #01   SET DATE & TIME                           01 Jan. 2002 12:01AM
 #02   YOUR LOGO
 #03   YOUR FAX NUMBER
 #04   PRINT SENDING REPORT                      ERROR       [ERROR,ON,OFF]
 #06   FAX RING COUNT                            2           [1...9]
 #17   RINGER PATTERN                            A           [A,B,C]

  【 ADVANCED FEATURE LIST 】

 NO.   FEATURE                                   CURRENT SETTING
 #22   JOURNAL AUTO PRINT                        ON          [ON,OFF]
 #23   OVERSEAS MODE                             OFF         [ON,OFF]
 #25   DELAYED TRANSMISSION                      OFF         [ON,OFF]
                              DESTINATION =
                               START TIME = 12:00AM
 #26   AUTO CALLER ID LIST                       ON          [ON,OFF]
 #30   SILENT FAX RECOGNITION RING               3           [3...9]
 #34   QUICK SCAN                                OFF         [ON,OFF]
 #36   RCV REDUCTION                             92%         [72,86,92,100]
 #39   LCD CONTRAST                              NORMAL      [NORMAL,DARKER]
 #41   FAX ACTIVATION CODE                       ON          [ON,OFF]
                                     CODE = *9
 #44   MEMORY RECEIVE ALERT                      ON          [ON,OFF]
 #46   FRIENDLY RECEPTION                        ON          [ON,OFF]
 #49   AUTO DISCONNECT                           ON          [ON,OFF]
                                     CODE = *0
 #68   ECM SELECTION                             ON          [ON,OFF]
 NOTE : You cannot change the setting of this feature,
        if there are stored documents in memory.

 #70   FAX PAGER CALL                            OFF         [ON,OFF]
                              DESTINATION =
 #76   CONNECTING TONE                           ON          [ON,OFF]
 #77   AUTO ANSWER MODE                          FAX ONLY    [FAX ONLY,TEL/FAX]
 #78   TEL/FAX DELAYED RING                      2           [1...9]
 #80   SET DEFAULT (EXCEPT #68)
```

Note:

The above values are the default values.

3.4.3.2. KX-FP151GR

SETUP LIST


Code
Set Value
Code
Set Value

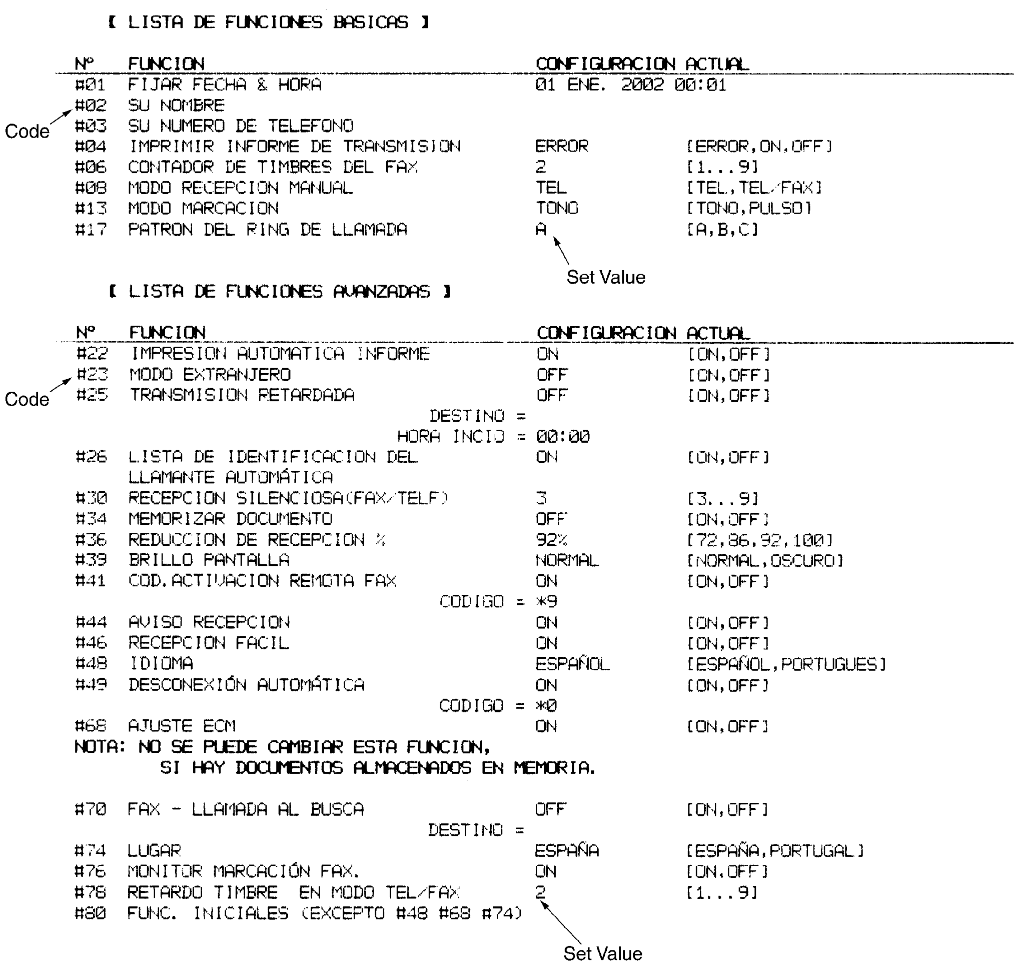
```
[ BASIC FEATURE LIST ]

NO.  FEATURE                                   CURRENT SETTING
#01  SET DATE & TIME                           01 Jan. 2002 12:01AM
#02  YOUR LOGO
#03  YOUR FAX NUMBER
#04  PRINT SENDING REPORT                      ERROR        [ERROR,ON,OFF]
#06  FAX RING COUNT                            2            [1...9]
#17  RINGER PATTERN                            A            [A,B,C]

[ ADVANCED FEATURE LIST ]

NO.  FEATURE                                   CURRENT SETTING
#22  JOURNAL AUTO PRINT                        ON           [ON,OFF]
#23  OVERSEAS MODE                             OFF          [ON,OFF]
#25  DELAYED TRANSMISSION                      OFF          [ON,OFF]
                             DESTINATION =
                              START TIME = 12:00AM
#26  AUTO CALLER ID LIST                       ON           [ON,OFF]
#30  SILENT FAX RECOGNITION RING               3            [3...9]
#34  QUICK SCAN                                OFF          [ON,OFF]
#36  RCV REDUCTION                             92%          [72,86,92,100]
#39  LCD CONTRAST                              NORMAL       [NORMAL,DARKER]
#41  FAX ACTIVATION CODE                       ON           [ON,OFF]
                                    CODE = *9
#44  MEMORY RECEIVE ALERT                      ON           [ON,OFF]
#46  FRIENDLY RECEPTION                        ON           [ON,OFF]
#49  AUTO DISCONNECT                           ON           [ON,OFF]
                                    CODE = *0
#68  ECM SELECTION                             ON           [ON,OFF]
NOTE : You cannot change the setting of this feature,
       if there are stored documents in memory.

#70  FAX PAGER CALL                            OFF          [ON,OFF]
                             DESTINATION =
#76  CONNECTING TONE                           ON           [ON,OFF]
#77  AUTO ANSWER MODE                          FAX ONLY     [FAX ONLY,TEL/FAX]
#78  TEL/FAX DELAYED RING                      2            [1...9]
#80  SET DEFAULT (EXCEPT #68)
```

Note:
The above values are the default values.

3.4.3.3. KX-FP151SP

SPANISH

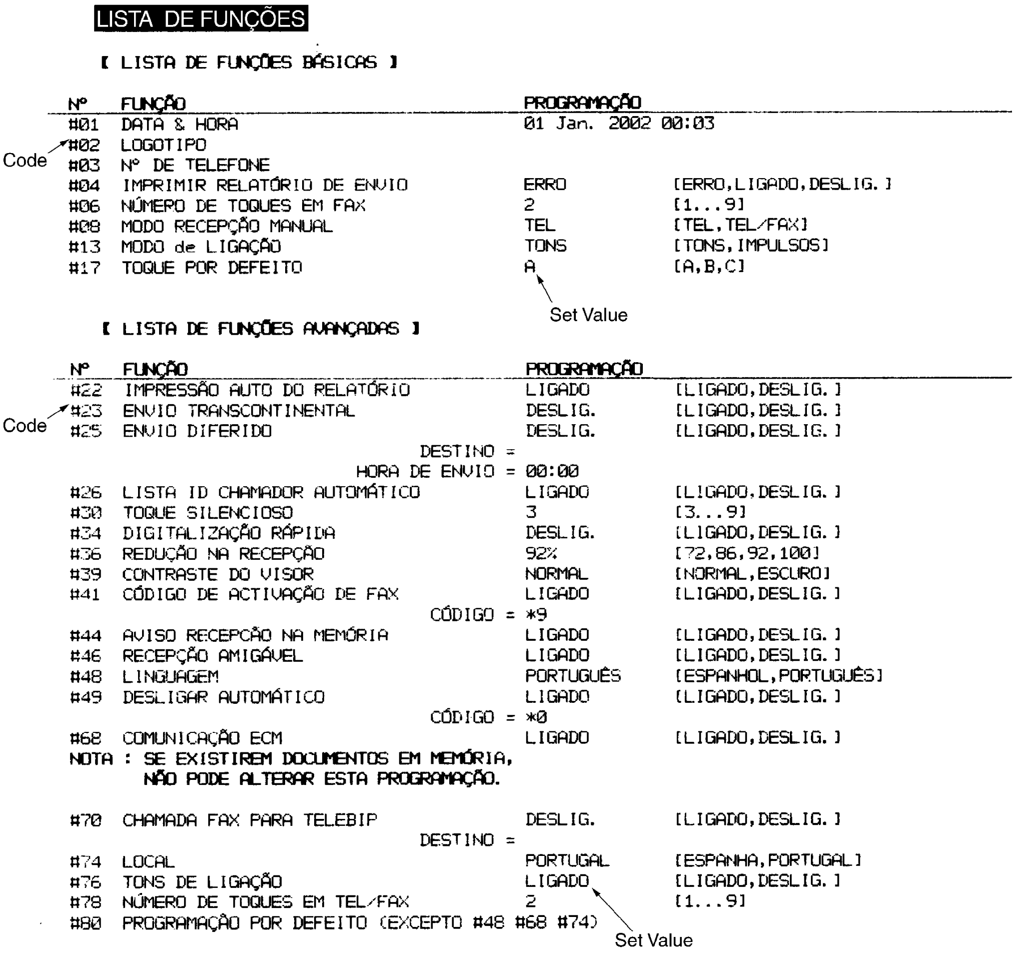
LISTA FUNCIONES


Code
Set Value
Code
Set Value

```
[ LISTA DE FUNCIONES BASICAS ]

 Nº   FUNCION                               CONFIGURACION ACTUAL
#01  FIJAR FECHA & HORA                     01 ENE. 2002 00:01
#02  SU NOMBRE
#03  SU NUMERO DE TELEFONO
#04  IMPRIMIR INFORME DE TRANSMISION        ERROR          [ERROR,ON,OFF]
#06  CONTADOR DE TIMBRES DEL FAX            2              [1...9]
#08  MODO RECEPCION MANUAL                  TEL            [TEL,TEL/FAX]
#13  MODO MARCACION                         TONO           [TONO,PULSO]
#17  PATRON DEL RING DE LLAMADA             A              [A,B,C]

[ LISTA DE FUNCIONES AVANZADAS ]

 Nº   FUNCION                               CONFIGURACION ACTUAL
#22  IMPRESION AUTOMATICA INFORME           ON             [ON,OFF]
#23  MODO EXTRANJERO                        OFF            [ON,OFF]
#25  TRANSMISION RETARDADA                  OFF            [ON,OFF]
                              DESTINO =
                          HORA INCIO = 00:00
#26  LISTA DE IDENTIFICACION DEL            ON             [ON,OFF]
     LLAMANTE AUTOMÁTICA
#30  RECEPCION SILENCIOSA(FAX/TELF)         3              [3...9]
#34  MEMORIZAR DOCUMENTO                    OFF            [ON,OFF]
#36  REDUCCION DE RECEPCION %               92%            [72,86,92,100]
#39  BRILLO PANTALLA                        NORMAL         [NORMAL,OSCURO]
#41  COD.ACTIVACION REMOTA FAX              ON             [ON,OFF]
                               CODIGO = *9
#44  AVISO RECEPCION                        ON             [ON,OFF]
#46  RECEPCION FACIL                        ON             [ON,OFF]
#48  IDIOMA                                 ESPAÑOL        [ESPAÑOL,PORTUGUES]
#49  DESCONEXIÓN AUTOMÁTICA                 ON             [ON,OFF]
                               CODIGO = *0
#68  AJUSTE ECM                             ON             [ON,OFF]
NOTA: NO SE PUEDE CAMBIAR ESTA FUNCION,
      SI HAY DOCUMENTOS ALMACENADOS EN MEMORIA.

#70  FAX - LLAMADA AL BUSCA                 OFF            [ON,OFF]
                              DESTINO =
#74  LUGAR                                  ESPAÑA         [ESPAÑA,PORTUGAL]
#76  MONITOR MARCACIÓN FAX.                 ON             [ON,OFF]
#78  RETARDO TIMBRE  EN MODO TEL/FAX        2              [1...9]
#80  FUNC. INICIALES (EXCEPTO #48 #68 #74)
```

Note:
The above values are the default values.

PORTUGUESE



```
LISTA  DE FUNÇÕES

   [ LISTA DE FUNÇÕES BÁSICAS ]

Nº   FUNÇÃO                                     PROGRAMAÇÃO
------------------------------------------------------------------------------------------
#01  DATA & HORA                                01 Jan.  2002 00:03
#02  LOGOTIPO
#03  Nº DE TELEFONE
#04  IMPRIMIR RELATÓRIO DE ENVIO                ERRO         [ERRO,LIGADO,DESLIG.]
#06  NÚMERO DE TOQUES EM FAX                    2            [1...9]
#08  MODO RECEPÇÃO MANUAL                       TEL          [TEL,TEL/FAX]
#13  MODO de LIGAÇÃO                            TONS         [TONS,IMPULSOS]
#17  TOQUE POR DEFEITO                          A            [A,B,C]

   [ LISTA DE FUNÇÕES AVANÇADAS ]

Nº   FUNÇÃO                                     PROGRAMAÇÃO
------------------------------------------------------------------------------------------
#22  IMPRESSÃO AUTO DO RELATÓRIO                LIGADO       [LIGADO,DESLIG.]
#23  ENVIO TRANSCONTINENTAL                     DESLIG.      [LIGADO,DESLIG.]
#25  ENVIO DIFERIDO                             DESLIG.      [LIGADO,DESLIG.]
                                     DESTINO =
                               HORA DE ENVIO =  00:00
#26  LISTA ID CHAMADOR AUTOMÁTICO               LIGADO       [LIGADO,DESLIG.]
#30  TOQUE SILENCIOSO                           3            [3...9]
#34  DIGITALIZAÇÃO RÁPIDA                       DESLIG.      [LIGADO,DESLIG.]
#36  REDUÇÃO NA RECEPÇÃO                        92%          [72,86,92,100]
#39  CONTRASTE DO VISOR                         NORMAL       [NORMAL,ESCURO]
#41  CÓDIGO DE ACTIVAÇÃO DE FAX                 LIGADO       [LIGADO,DESLIG.]
                                      CÓDIGO =  *9
#44  AVISO RECEPCÃO NA MEMÓRIA                  LIGADO       [LIGADO,DESLIG.]
#46  RECEPÇÃO AMIGÁVEL                          LIGADO       [LIGADO,DESLIG.]
#48  LINGUAGEM                                  PORTUGUÊS    [ESPANHOL,PORTUGUÊS]
#49  DESLIGAR AUTOMÁTICO                        LIGADO       [LIGADO,DESLIG.]
                                      CÓDIGO =  *0
#68  COMUNICAÇÃO ECM                            LIGADO       [LIGADO,DESLIG.]
NOTA : SE EXISTIREM DOCUMENTOS EM MEMÓRIA,
       NÃO PODE ALTERAR ESTA PROGRAMAÇÃO.

#70  CHAMADA FAX PARA TELEBIP                   DESLIG.      [LIGADO,DESLIG.]
                                     DESTINO =
#74  LOCAL                                      PORTUGAL     [ESPANHA,PORTUGAL]
#76  TONS DE LIGAÇÃO                            LIGADO       [LIGADO,DESLIG.]
#78  NÚMERO DE TOQUES EM TEL/FAX                2            [1...9]
#80  PROGRAMAÇÃO POR DEFEITO (EXCEPTO #48 #68 #74)
```

Note:

The above values are the default values except #48 and #74.

3.4.4. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	----------
502	Flash time (KX-FP151E)	X 10 ms	01~99	08	----------
	Flash time (KX-FP151GR)			12	
	Flash time (KX-FP151SP-#74 is SPAIN)			09	
	Flash time (KX-FP151SP-#74 is PORTUGAL)			23	
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See Symptom/Countermea Table for long distance an international calls in THE COPY, BUT CANNOT EITH TRANSMIT/RECEIVE LON DISTANCE OR INTERNATI COMMUNICATIONS ().
521	International mode select	1:ON 2: OFF	1, 2	1	See Symptom/Countermea Table for long distance an international calls in THE COPY, BUT CANNOT EITH TRANSMIT/RECEIVE LON DISTANCE OR INTERNATI COMMUNICATIONS ().
522	Auto standby select	1:ON 2: OFF	1, 2	1	The resolution reverts to t when transmission is com
523	Receive equalizer select	1:0 km 2:1.8 km 3:3.6 km 4:7.2 km	1~4	1	When the telephone statio from the unit or reception be performed correctly, ad accordingly.
524	Transmission equalizer select	1:0 km 2:1.8 km 3:3.6 km 4:7.2 km	1~4	1	When the telephone statio from the unit or transmissi cannot be performed corre adjust accordingly.
546	Flash time (CO) (KX-FP151E only)	X 10 ms.	01~99	08	----------
550	Memory clear: To reset the value to the default one, except the top margin (853) and left margin (854).				"START" input Turn OFF a the power switch to operat correctly.
551	ROM check				See TEST FUNCTIONS().
552	DTMF single tone test	1:ON 2: OFF	1, 2	2	See TEST FUNCTIONS().
553	Monitor on FAX communication select	1:OFF 2: PHASE B 3 :ALL	1~3	1	Sets whether to monitor t signal with the unit's spea during FAX communicatio
554	Modem test				See TEST FUNCTIONS().
555	Scan check				See TEST FUNCTIONS().

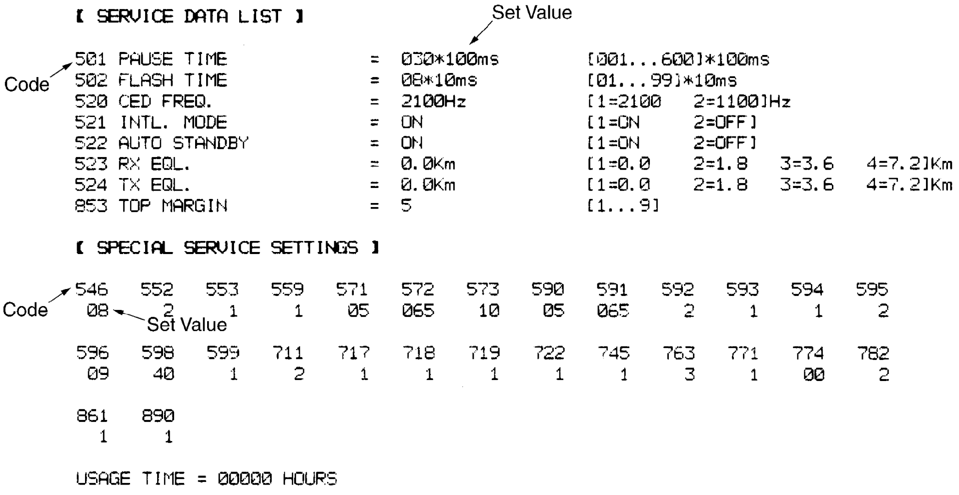
Code	Function	Set Value	Effective Range	Default	Remarks
556	Motor test			0	See TEST FUNCTIONS().
557	LED test				----------
558	LCD test				See TEST FUNCTIONS().
559	Document jam detection select	1:ON 2: OFF	1, 2	1	See DOCUMENT JAMS().
561	KEY test				See TEST FUNCTIONS().
571	ITS auto redial time set	X number of times	00~14	05	Selects the number of time ITS is redialed (not includi first dial).
572	ITS auto redial line disconnection time set	X second	005~999	065	Sets the interval of ITS red
573	Remote turn-on ring number set	X number of rings	01~99	10	Sets the number of rings b unit starts to receive a doc the TEL mode.
575	OFF-HOOK alarm option (KX-FP151GR, KX-FP151SP)	1:ON 2: OFF	1, 2	2	----------
590	FAX auto redial time set	X number of times	00~14	05	Selects the number of redi during FAX communicatio including the first dial).
591	FAX auto redial time disconnection time set	X second	005~999	065	Sets the FAX redial interva FAX communication.
592	CNG transmit select	1:OFF 2:ALL 3:AUTO	1~3	2	Lets you select the CNG o during FAX transmission. CNG is output at phase A. CNG id output only when a dialing is performed. OFF: not output at phase A. Ref SOMETIME THERE IS A TF PROBLEM().
593	Time between CED and 300bps	1:75 msec 2:500 msec 3:1 sec	1~3	1	See Symptom/Countermea Table for long distance an international calls in THE COPY, BUT CANNOT EITH TRANSMIT/RECEIVE LON DISTANCE OR INTERNATI COMMUNICATIONS (). Ref RECEIVE PROBLEM() .

Code	Function	Set Value	Effective Range	Default	Remarks
594	Overseas DIS detection select	1:detects at the 1st time 2:detects at the 2st time	1, 2	1	See Symptom/Countermea Table for long distance an international calls in THE COPY, BUT CANNOT EITH TRANSMIT/RECEIVE LON DISTANCE OR INTERNATI COMMUNICATIONS (). Ref SOMETIME THERE IS A T PROBLEM().
595	Receive error limit value set	X Number of times	1~4	2	Sets the number of accept lines when the FAX recons the received data. Refer to RECEIVE PROBLEM().
596	Transmit level set	X dBm	- 15~00	09	Selects the FAX transmiss Refer to SOMETIME THER TRANSMIT PROBLEM ()an RECEIVE PROBLEM ().
598	Receiving sensitivity	43= -43 dBm	20~48	40	Used when there is an err problem. Refer to THE UNI COPY, BUT CANNOT EITH TRANSMIT/RECEIVE LON DISTANCE OR INTERNATI COMMUNICATIONS().
599	ECM frame size	1:256 2:64	1, 2	1	----------
711	Dialing mode (KX-FP151E, KX-FP151GR)	1:PULSE 2 :TONE	1, 2	2	----------
717	Transmit speed selection	1:9600BPS 2:7200BPS 3:4800BPS 4:2400BPS	1~4	1	Adjusts the speed to start during FAX transmission. SOMETIME THERE IS A T PROBLEM ()and THE UNIT COPY, BUT THE TRANSMI AND RECEPTION IMAGE INCORRECT().
718	Receive speed selection	1:9600BPS 2:7200BPS 3:4800BPS 4:2400BPS	1~4	1	Adjusts the speed to start during FAX reception. Ref RECEIVE PROBLEM() and UNIT CAN COPY, BUT THE TRANSMISSION AND REC IMAGE ARE INCORRECT (
719	Ringer off in TEL/FAX mode	1:ON 2: OFF	1, 2	1	Selects the ringer switch c call is received in the TEL mode.
722	Redial tone detect	1:ON 2: OFF	1, 2	1	Sets the tone detection m redialing.

Code	Function	Set Value	Effective Range	Default	Remarks
745	Power ON film feed	1:ON 2: OFF	1, 2	1	When the power is turned film is wound to take up a
763	CNG detect time for friendly reception	1:10 sec 2:20 sec 3:30 sec	1~3	3	Selects the CNG detection friendly reception.
771	T1 timer	1:35 sec 2:60 sec	1, 2	1	Sets a higher value when t response from the other p needs more time during F transmission.
773	DIS-DCS interval (KX-FP151SP only)	1:100 msec 2:460 msec	1,2	2	This is similar to code 594 interval from receiving DIS sending DCS can be chan wait for the echo canceler recover.
774	T4 timer	X 100 msec	00~99	0	Use this function when de occurs in the line and communication (ex. Mobil does not work well.
782	Caller ID AC select (KX-FP151E only)	1:ON 2: OFF	1, 2	2	----------
815	Sensor & Vox check				See TEST FUNCTIONS().
852	Print test pattern				See TEST FUNCTIONS().
853	Top margin		1~9	5	----------
861	A4 size set	1:ON 2: OFF	1, 2	1	----------
880	History list				See HISTORY().
881	Journal 2 list				See PRINTOUT EXAMPLE(
882	Journal 3 list				See PRINTOUT EXAMPLE(
890	TEL/FAX 1st ring back tone	1:ON 2: OFF	1, 2	1	Selects whether the TEL/F ring back tone is ON or OF TEL/FAX mode.

3.4.5. SERVICE MODE SETTINGS (Example of a printed out list)

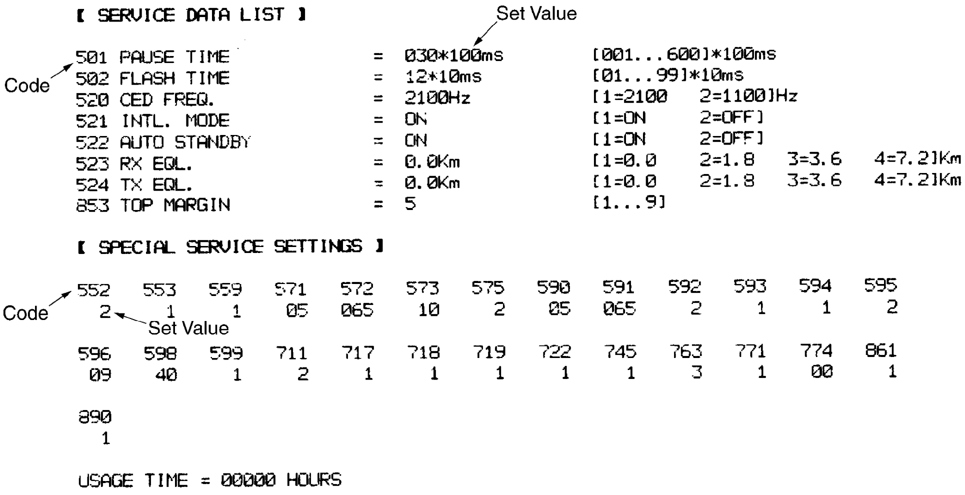
3.4.5.1. KX-FP151E


Set Value
Code
Code
Set Value

```
【 SERVICE DATA LIST 】

501 PAUSE TIME          =  030*100ms     [001...600]*100ms
502 FLASH TIME          =  08*10ms       [01...99]*10ms
520 CED FREQ.           =  2100Hz        [1=2100   2=1100]Hz
521 INTL. MODE          =  ON            [1=ON     2=OFF]
522 AUTO STANDBY        =  ON            [1=ON     2=OFF]
523 RX EQL.             =  0.0Km         [1=0.0    2=1.8   3=3.6   4=7.2]Km
524 TX EQL.             =  0.0Km         [1=0.0    2=1.8   3=3.6   4=7.2]Km
853 TOP MARGIN          =  5             [1...9]

【 SPECIAL SERVICE SETTINGS 】

546   552   553   559   571   572   573   590   591   592   593   594   595
 08     2     1     1    05   065    10    05   065     2     1     1     2

596   598   599   711   717   718   719   722   745   763   771   774   782
 09    40     1     2     1     1     1     1     1     3     1    00     2

861   890
  1     1

USAGE TIME = 00000 HOURS
```

Note:
The above values are the default values.

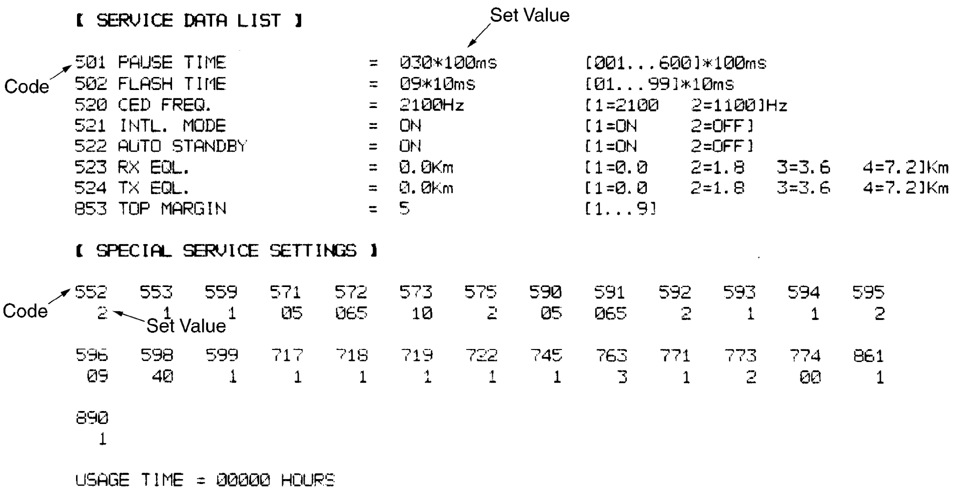
3.4.5.2. KX-FP151GR


Set Value
Code
Code
Set Value

```
【 SERVICE DATA LIST 】

501 PAUSE TIME          =  030*100ms     [001...600]*100ms
502 FLASH TIME          =  12*10ms       [01...99]*10ms
520 CED FREQ.           =  2100Hz        [1=2100   2=1100]Hz
521 INTL. MODE          =  ON            [1=ON     2=OFF]
522 AUTO STANDBY        =  ON            [1=ON     2=OFF]
523 RX EQL.             =  0.0Km         [1=0.0    2=1.8   3=3.6   4=7.2]Km
524 TX EQL.             =  0.0Km         [1=0.0    2=1.8   3=3.6   4=7.2]Km
853 TOP MARGIN          =  5             [1...9]

【 SPECIAL SERVICE SETTINGS 】

552   553   559   571   572   573   575   590   591   592   593   594   595
  2     1     1    05   065    10     2    05   065     2     1     1     2

596   598   599   711   717   718   719   722   745   763   771   774   861
 09    40     1     2     1     1     1     1     1     3     1    00     1

890
  1

USAGE TIME = 00000 HOURS
```

Note:
The above values are the default values.

3.4.5.3. KX-FP151SP

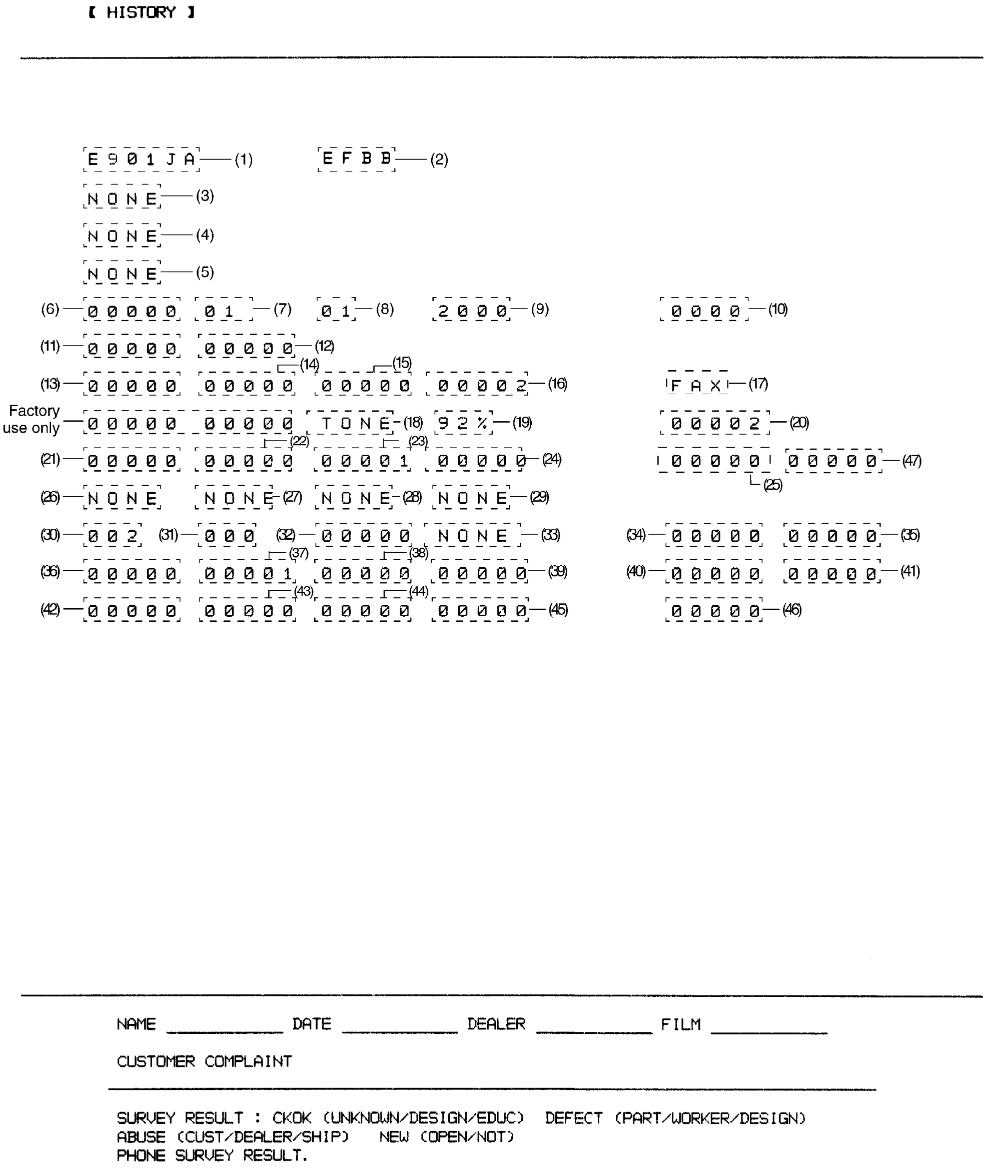

Code
Set Value
Code
Set Value

```
【 SERVICE DATA LIST 】

501 PAUSE TIME            =   030*100ms       [001...600]*100ms
502 FLASH TIME            =   09*10ms         [01...99]*10ms
520 CED FREQ.             =   2100Hz          [1=2100   2=1100]Hz
521 INTL. MODE            =   ON              [1=ON     2=OFF]
522 AUTO STANDBY          =   ON              [1=ON     2=OFF]
523 RX EQL.               =   0.0Km           [1=0.0    2=1.8    3=3.6    4=7.2]Km
524 TX EQL.               =   0.0Km           [1=0.0    2=1.8    3=3.6    4=7.2]Km
853 TOP MARGIN            =   5               [1...9]

【 SPECIAL SERVICE SETTINGS 】

552   553   559   571   572   573   575   590   591   592   593   594   595
  2     1     1    05   065    10     2    05   065     2     1     1     2

596   598   599   717   718   719   722   745   763   771   773   774   861
 09    40     1     1     1     1     1     1     3     1     2    00     1

890
  1

USAGE TIME = 00000 HOURS
```

Note:

The above values are the default values.

3.4.6. HISTORY


[HISTORY]

E901JA (1)
EFBB (2)
NONE (3)
NONE (4)
NONE (5)
(6) 00000
01 (7)
01 (8)
2000 (9)
0000 (10)
(11) 00000
00000 (12)
(13) 00000
00000 (14)
00000 (15)
00002 (16)
FAX (17)
Factory use only 00000 00000
TONE (18)
92% (19)
00002 (20)
(21) 00000
00000 (22)
00001 (23)
00000 (24)
000000 (25)
00000 (47)
(26) NONE
NONE (27)
NONE (28)
NONE (29)
(30) 002
(31) 000
(32) 00000
NONE (33)
(34) 00000
00000 (35)
(36) 00000
00001 (37)
00000 (38)
00000 (39)
(40) 00000
00000 (41)
(42) 00000
00000 (43)
00000 (44)
00000 (45)
00000 (46)

NAME ____________ DATE ____________ DEALER ____________ FILM ____________

CUSTOMER COMPLAINT

SURVEY RESULT : CKOK (UNKNOWN/DESIGN/EDUC) DEFECT (PART/WORKER/DESIGN)
ABUSE (CUST/DEALER/SHIP) NEW (OPEN/NOT)
PHONE SURVEY RESULT.

Note:
See the following descriptions of this report. Item No. (1) ~ (47) are corresponding to the listed items in DESCRIPTIONS OF THE HISTORY REPORT().

3.4.6.1. DESCRIPTIONS OF THE HISTORY REPORT

(1) ROM VERSION

EPROM version

(2) SUM

EPROM internal data calculation.

(3) YOUR LOGO

The user logo recorded in the unit. If it is not recorded, NONE will be displayed.

(4) YOUR TELEPHONE NUMBER

The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed.

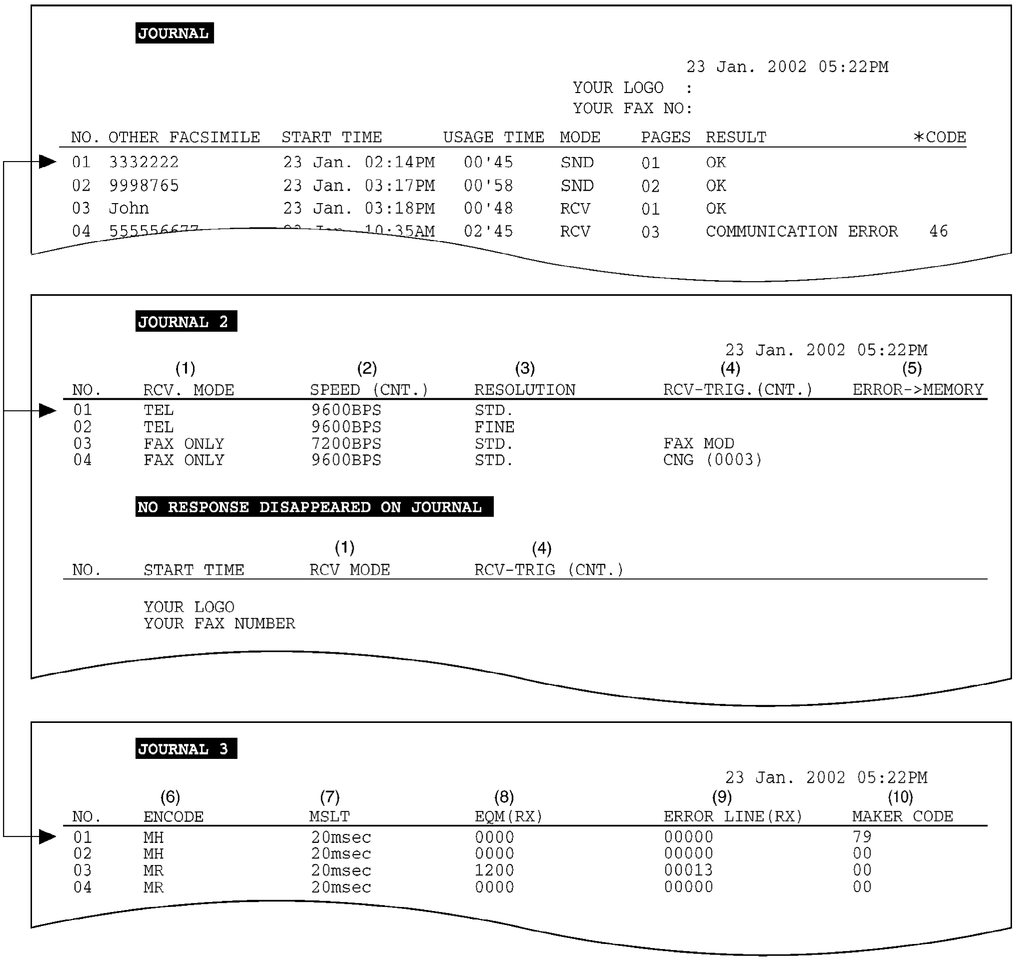
(5) FAX PAGER NUMBER

If you program a pager number into the unit, the pager number will be displayed here.
(6) FACTORY - CUSTOMER
This shows how many days from factory production until the user turns ON the unit.
(7) MONTH
The shows the very first month, date, year and time set by the user after they purchased the unit.
(8) DAY
The shows the very first month, date, year and time set by the user after they purchased the unit.
(9) YEAR
The shows the very first month, date, year and time set by the user after they purchased the unit.
(10) TIME
The shows the very first month, date, year and time set by the user after they purchased the unit.
(11) USAGE TIME
The amount of time the unit has been powered ON.
(12) FACTORY - NOW
This shows how many days from factory production until the user prints out this history list.
(13) TEL MODE
The amount of time the TEL mode setting was used.
(14) FAX MODE
The amount of time the FAX mode setting was used.
(15) TEL/FAX MODE
The amount of time the TEL/FAX mode setting was used.
(16) ANS/FAX MODE
The amount of time the ANS/FAX mode setting was used.
(17) FINAL RECEIVE MODE
The last set receiving mode by the user.
(18) TONE/PULSE SELECTION
The most recently used setting used, either TONE or PULSE.
(19) RECEIVE REDUCTION
The compression rate when receiving.
(20) SETTING NO. OF DIRECTORY
The recorded directory stations (one touch and JOG DIAL).
(21) NUMBER OF COPY
The number of pages copied.
(22) NUMBER OF RECEIVE
The number of pages received.
(23) NUMBER OF SENDING
The number of pages sent.
(24) NUMBER OF CALLER ID
The number of times Caller ID was received.
(25) NUM(BER OF RECORDING MESSAGE
The number of messages recorded in TAM.
(26) Not Used
(27) Not Used
(28) Not Used
(29) Not Used
(30) NUMBER OF PRINTING WARNING LIST
The number of warning lists printed until now.
(31) NUMBER OF PRINTING HELP
The number of help lists printed until now.

(32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION
The number of faxes received that were divided into more than one sheet since the unit was purchased.
(33) Not Used
(34) Not Used
(35) Not Used
(36) FAX MODE
Means the unit received a fax message in the FAX mode.
(37) MAN RCV
Means the unit received a fax message by manual operation.
(38) FRN RCV
Means the unit received a fax message by friendly signal detection.
(39) VOX
Means the unit detected silence or no voice.
(40) RMT DTMF
Means the unit detected DTMF (Remote Fax activation code) entered remotely.
(41) PAL DTMF
Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
(42) TURN-ON
Means the unit started to receive after 15 rings. (Remote Turn On: Service Code #573)
(43) TIME OUT
Means the unit started to receive after Ring Time Out in the EXT-TAM or TEL/FAX mode.
(44) IDENT
Means the unit detected Ring Detection.
(45) CNG OGM
Means the unit detected the CNG while it was sending the Dummy Ring Back Tone in the TEL/FAX mode, or while answering a call in the EXT-TAM mode. Or means the unit detected the CNG while it was sending the OGM in the ANS/FAX mode.
(46) CNG ICM
Means the unit detected the CNG while it was recording the ICM in the ANS/FAX mode.
(47) Not Used

3.4.7. SPECIAL SERVICE JOURNAL REPORTS

Journal 2 and Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 881 or 882. Remote printing function for the journal reports (JOURNAL, JOURNAL 2 and JOURNAL 3) is also available for service technicians. (Refer to REMOTE PROGRAMMING().) The JOURNAL report only gives you basic information about a communication, but the other two journal reports provide different information on the same item (communication).



```
JOURNAL

                                                  23 Jan. 2002 05:22PM
                                       YOUR LOGO   :
                                       YOUR FAX NO:
NO. OTHER FACSIMILE  START TIME       USAGE TIME  MODE    PAGES  RESULT                *CODE
01  3332222          23 Jan. 02:14PM   00'45      SND     01     OK
02  9998765          23 Jan. 03:17PM   00'58      SND     02     OK
03  John             23 Jan. 03:18PM   00'48      RCV     01     OK
04  555556677                10:35AM   02'45      RCV     03     COMMUNICATION ERROR   46
```

```
JOURNAL 2

                                                              23 Jan. 2002 05:22PM
         (1)              (2)              (3)                 (4)               (5)
NO.      RCV. MODE        SPEED (CNT.)     RESOLUTION          RCV-TRIG.(CNT.)   ERROR->MEMORY
01       TEL              9600BPS          STD.
02       TEL              9600BPS          FINE
03       FAX ONLY         7200BPS          STD.                FAX MOD
04       FAX ONLY         9600BPS          STD.                CNG (0003)

         NO RESPONSE DISAPPEARED ON JOURNAL

                          (1)              (4)
NO.      START TIME       RCV MODE         RCV-TRIG (CNT.)

         YOUR LOGO
         YOUR FAX NUMBER
```

```
JOURNAL 3

                                                              23 Jan. 2002 05:22PM
         (6)              (7)              (8)                 (9)               (10)
NO.      ENCODE           MSLT             EQM(RX)             ERROR LINE(RX)    MAKER CODE
01       MH               20msec           0000                00000             79
02       MH               20msec           0000                00000             00
03       MR               20msec           1200                00013             00
04       MR               20msec           0000                00000             00
```

HOW TO READ JOURNAL REPORTS:
Example:

1. **Look at NO. 01 in the JOURNAL. If you want to know about the details about that item, see NO. 01 in the JOURNAL 2 and the JOURNAL 3. You can get the following information.**
   *** MODE: Fax transmission**
   *** RCV. MODE: TEL**
   *** TX SPEED: 9.6 kbps**
   *** RESOLUTION: standard**
   *** ENCODE: MH**
   *** MAKER CODE: 79**
2. **Look at NO. 04 in the JOURNAL 2. CNG (0003) indicates that the CNG signal has been received three times since the purchase date.**

For further details, see JOURNAL 2() and JOURNAL 3().

3.4.7.1. JOURNAL 2

Refer to JOURNAL 2 in PRINTOUT EXAMPLE().
Journal 2 displays the additional detailed information about the last 35 communications.
Descriptions:
(1) RCV. MODE
Indicates which receive mode the unit was in when the unit received a fax message.
This information is also displayed when the unit transmitted a fax message.
(2) SPEED
Indicates the speed of the communication. If multiple pages are transmitted or received, it indicates the last page’s communication speed. If there is a communication error, "?" is displayed.
(3) RESOLUTION
Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page’s resolution. If there is a communication error, "?" is displayed.
(4) RCV-TRIG. (CNT.)
Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 2 in PRINTOUT EXAMPLE(). The values in parentheses indicate how many times the trigger has been used. (For example, "0003" means three times.)

No.	Display	Function
1	FAX MODE	Means the unit received a fax message in the FAX mode.
2	MAN RCV	Means the unit received a fax message by manual operation.
3	FRN RCV	Means the unit received a fax message by friendly signal detection.
4	VOX	Means the unit detected silence or no voice.
5	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
6	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
7	TURN-ON	Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)
8	TIME OUT	Means the unit started to receive after Ring Time Out in the EXT-TAM or TEL/FAX mode.
9	IDENT	Means the unit detected Ring Detection.
10	CNG OGM	Means the unit detected the CNG while it was sending the Dummy Ring Back Tone in the TEL/FAX mode. OR Means the unit detected the CNG while it was sending the OGM in the ANS/FAX mode.
11	CNG ICM	Means the unit detected the CNG while it was recording the ICM in the ANS/FAX mode.

(5) ERROR → MEMORY
Indicates the reason why the unit received a fax message in memory.
If you look at No.11 in the JOURNAL 2 in PRINTOUT EXAMPLE(), it shows the fax message was received in memory due to "PAPER OUT" error.

[NO RESPONSE DISAPPEARED ON JOURNAL]

The "NO RESPONSE DISAPPEARED ON JOURNAL" displays the information about the last 10 communications terminated by "No Response". (Some of the communications terminated by "No Response" were not displayed in the JOURNAL.)

When a fax transmission cannot be performed because the other party's unit is set to the TEL mode, "No response" will be printed.

3.4.7.2. JOURNAL 3

Refer to JOURNAL 3 in PRINTOUT EXAMPLE().

Descriptions:

(6) ENCODE

Compression Code: MH/MR

(7) MSLT

MSLT means Minimum Scan Line Time. Used only at the factory.

(8) EQM

EQM means Eye Quality Monitor. Used only at the factory.

(9) ERROR LINE(RX)

When an error occurs while receiving a fax, this shows the number of error lines.

(10) MAKER CODE

This shows a 2 digit code of the other party's fax machine brand.

0E: "KX" model
00: Unknown
79: "UF" model
19: "Xerox" model

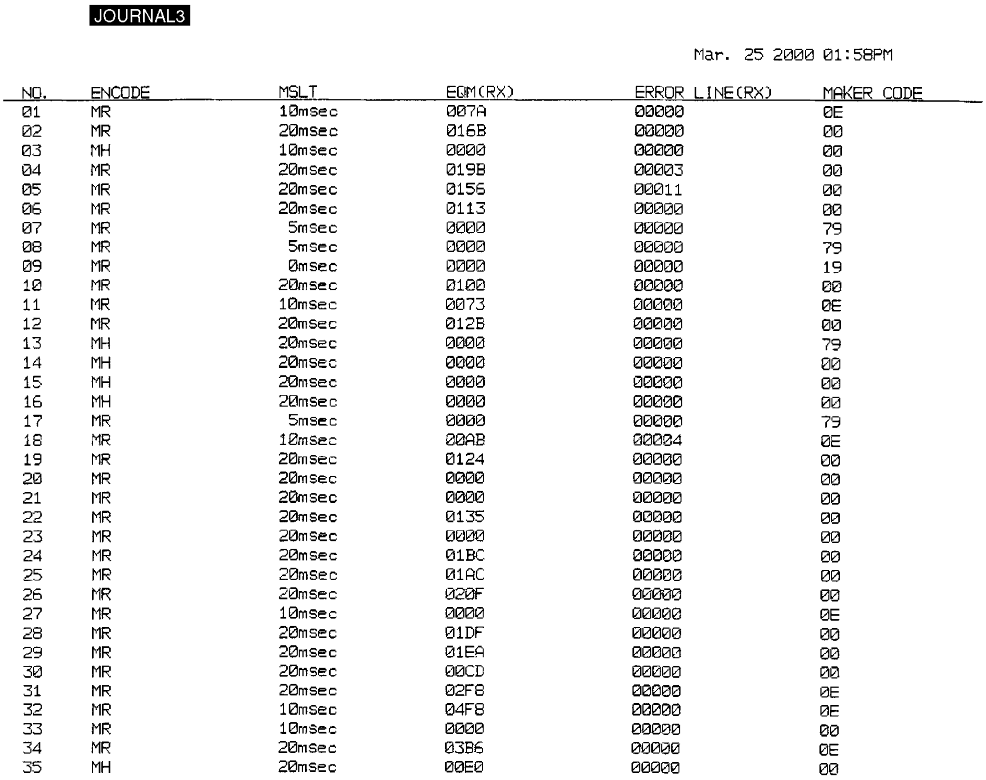
3.4.7.3. PRINTOUT EXAMPLE

JOURNAL2

```
                                                                Mar. 25 2000 01:59PM

NO.    RCV. MODE          SPEED  (CNT.)    RESOLUTION         RCV-TRIG.(CNT.)   ERROR->MEMORY
01     FAX ONLY           9600BPS          FINE.              FAX MOD
02     FAX ONLY           9600BPS          STD.               FAX MOD
03     FAX ONLY           9600BPS          FINE.
04     FAX ONLY           9600BPS          FINE.              FAX MOD
05     FAX ONLY           9600BPS          FINE.              FAX MOD
06     FAX ONLY           9600BPS          FINE.              FAX MOD
07     FAX ONLY           9600BPS          FINE.
08     FAX ONLY           9600BPS          FINE.
09     FAX ONLY           9600BPS          FINE.
10     FAX ONLY           9600BPS          STD.               FAX MOD
11     FAX ONLY           9600BPS          FINE.              FAX MOD           PAPER OUT
12     FAX ONLY           9600BPS          STD.               FAX MOD
13     FAX ONLY           9600BPS          STD.
14     FAX ONLY           ?                ?
15     FAX ONLY           ?                ?
16     FAX ONLY           ?                ?
17     FAX ONLY           9600BPS          STD.
18     FAX ONLY           9600BPS          FINE.              FAX MOD
19     FAX ONLY           9600BPS          STD.               FAX MOD
20     FAX ONLY           9600BPS          S-FINE.
21     FAX ONLY           9600BPS          FINE.
22     FAX ONLY           9600BPS          FINE.              FAX MOD
23     FAX ONLY           ?                ?                  FAX MOD
24     FAX ONLY           9600BPS          STD.               FAX MOD
25     FAX ONLY           9600BPS          STD.               FAX MOD
26     FAX ONLY           9600BPS          FINE.              FAX MOD
27     FAX ONLY           9600BPS          FINE.
28     FAX ONLY           9600BPS          STD.               FAX MOD
29     FAX ONLY           9600BPS          FINE.              FAX MOD
30     FAX ONLY           9600BPS          S-FINE.            FAX MOD
31     FAX ONLY           9600BPS          STD.               FAX MOD
32     FAX ONLY           9600BPS          STD.               FAX MOD
33     FAX ONLY           ?                ?                  FAX MOD
34     FAX ONLY           9600BPS          STD.               FAX MOD
35     FAX ONLY           9600BPS          STD.               FAX MOD
```

NO RESPONSE DISAPPEARED ON JOURNAL

```
NO.    START TIME         RCV MODE         RCV-TRIG.(CNT.)
```



JOURNAL3

Mar. 25 2000 01:58PM

NO.	ENCODE	MSLT	EQM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	10msec	007A	00000	0E
02	MR	20msec	016B	00000	00
03	MH	10msec	0000	00000	00
04	MR	20msec	019B	00003	00
05	MR	20msec	0156	00011	00
06	MR	20msec	0113	00000	00
07	MR	5msec	0000	00000	79
08	MR	5msec	0000	00000	79
09	MR	0msec	0000	00000	19
10	MR	20msec	0100	00000	00
11	MR	10msec	0073	00000	0E
12	MR	20msec	012B	00000	00
13	MH	20msec	0000	00000	79
14	MH	20msec	0000	00000	00
15	MH	20msec	0000	00000	00
16	MH	20msec	0000	00000	00
17	MR	5msec	0000	00000	79
18	MR	10msec	00AB	00004	0E
19	MR	20msec	0124	00000	00
20	MR	20msec	0000	00000	00
21	MR	20msec	0000	00000	00
22	MR	20msec	0135	00000	00
23	MR	20msec	0000	00000	00
24	MR	20msec	01BC	00000	00
25	MR	20msec	01AC	00000	00
26	MR	20msec	020F	00000	00
27	MR	10msec	0000	00000	0E
28	MR	20msec	01DF	00000	00
29	MR	20msec	01EA	00000	00
30	MR	20msec	00CD	00000	00
31	MR	20msec	02F8	00000	0E
32	MR	10msec	04F8	00000	0E
33	MR	10msec	0000	00000	00
34	MR	20msec	03B6	00000	0E
35	MH	20msec	00E0	00000	00

3.5. TEST FUNCTIONS

The codes listed below can be used to perform simple checks of some of the unit’s functions. When complaints are received from customers, they provide an effective tool for identifying the locations and causes of malfunctions.

Test Mode	Type of Mode	Code Operation after code input	Function
MOTOR TEST	Service Mode	“5” “5” “6” START	Rotates the transmission and reception motor to operation of the motor. 13: FAX TX / Reading memory 14: Document feed 23: Recording paper is fed 33: List / FAX RX print, pull back recording paper 43: Copy 05: Recording paper feed (Test a recording paper feeding operation by shif 23 to 33). Pre STOP button to quit.
MODEM TEST	Service Mode	“5” “5” “4” START	Telephone line circuit is connected automatically, the following signals on the circuit line. 1) OFF 2) 9600bps 3)7200bps 4) 4800bps 5) 2400bps 6) 300bps 7) 2100Hz 8)1100Hz
ROM CHECK	Service Mode	“5” “5” “1” START	Indicates the version and checks the sum of the
SCAN CHECK	Service Mode	“5” “5” “5” START	Turns on the LEDs of the CIS and operates the re systems.
LCD CHECK	Service Mode	“5” “5” “8” START	Checks the LCD indication. Illuminates all the dots to check if they are norma
DTMF SINGLE TEST	Service Mode	“5” “5” “2” 1....ON 2....OFF	Outputs the DTMF as single tones. Used to check frequencies of the individual DTMF tones. Refer t SINGLE TONE TRANSMIT SELECTION ().
KEY CHECK	Service Mode	“5” “6” “1” START (any key)	Checks the button operation. Indicates the button code on the LCD while the bu pressed. Refer to BUTTON CODE TABLE ().
FACTORY SET	Service Mode	“5” “5” “0” START	Clears the memory where the users can store dat
PRINT TEST PATTERN	Service Mode	“8” “5” “2” START	Prints out the test pattern. Used mainly at the factory to test the print quality You can select 1~4. (See PRINT TEST PATTERN (

Test Mode	Type of Mode	Code	Function
		Operation after code input	
SENSOR CHECK & VOX CHECK	Service Mode	"8" "1" "5"	If you enter this mode and operate sensor levers hands, the LCD display of the related sensor (or s turns ON / OFF. Also, when copying a document, related sensor will turn ON / OFF. (Do, Sn, Co, Pt For each sensor's operation, refer to SENSORS A SWITCHES(). [Do Sn Co Pt Vx] : LCD DISPLAY Do: Document set sensor :Paper inserted. Turns on when a document is ins Sn: Read position sensor. :At the read position, turns on when the front cov opened and the sensor lever is pressed directory. Co: Cover open sensor / Film end sensor :Cover open of don't set the film. Turns on and of front cover is opened and closed. Pt: Paper top sensor :Sensor on Turns on when the front cover is oper the sensor lever is pressed directly. Vx: Vox signal :Detection signal for the tone on the line. Turns o there is a tone signal on the line.
		START	

Note:

The numbers in the "XXX" indicate the keys to be input for the various test modes.

3.5.1. DTMF SINGLE TONE TRANSMIT SELECTION

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	High Frequency (Hz)	key	Low Frequency (Hz)
“1”	697	“5”	1209
“2”	770	“6”	1336
“3”	852	“7”	1477
“4”	941	“8”	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) Low (Hz)	1209	1336	1477
697	“1”	“2”	“3”
770	“4”	“5”	“6”
852	“7”	“8”	“9”
941	“*”	“0”	“#”

Note:

After performing this check, do not forget to turn the setting off. Otherwise, dialing in DTMF signal will not work.

3.5.2. BUTTON CODE TABLE

Code	Button Name	Code	Button Name	Code	Button Name
04	FAX /START / SET	31	1	3B	*
06	COPY	32	2	3C	#
08	MONITOR	33	3	3D	REDIAL / PAUSE
0A	MUTE	34	4	3E	FLASH
0C	AUTO ANSWER	35	5	47	CALLER ID
20	MENU	36	6	1E	► NEXT
22	HELP	37	7	1F	◄ PREV
25	⊞ VOLUME	38	8	00	NO INPUT
26	⊟ VOLUME	39	9	01	STOP
		3A	0		

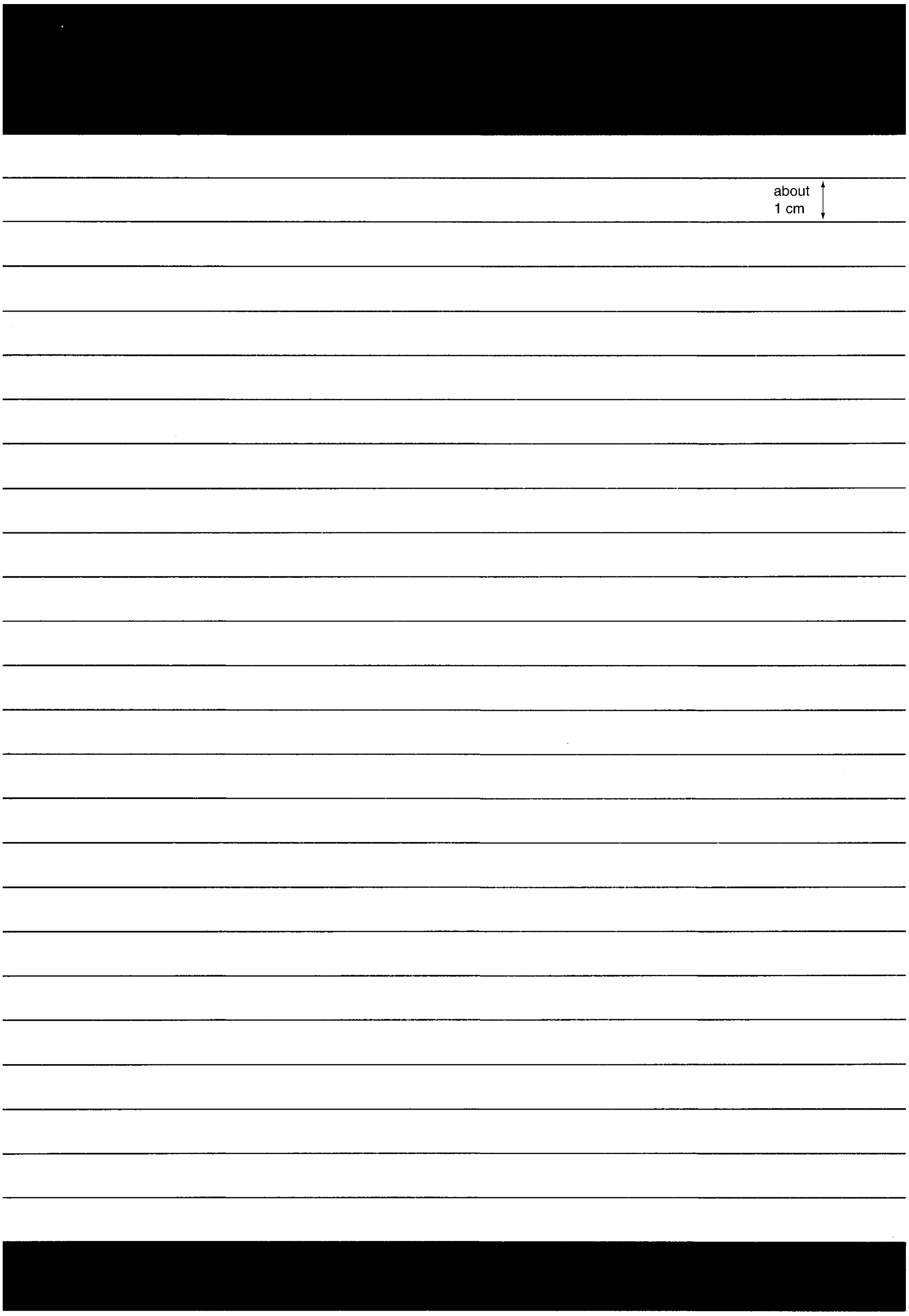
Caution:

These codes (00, 01) are only for the data in the History Report.

3.5.3. PRINT TEST PATTERN

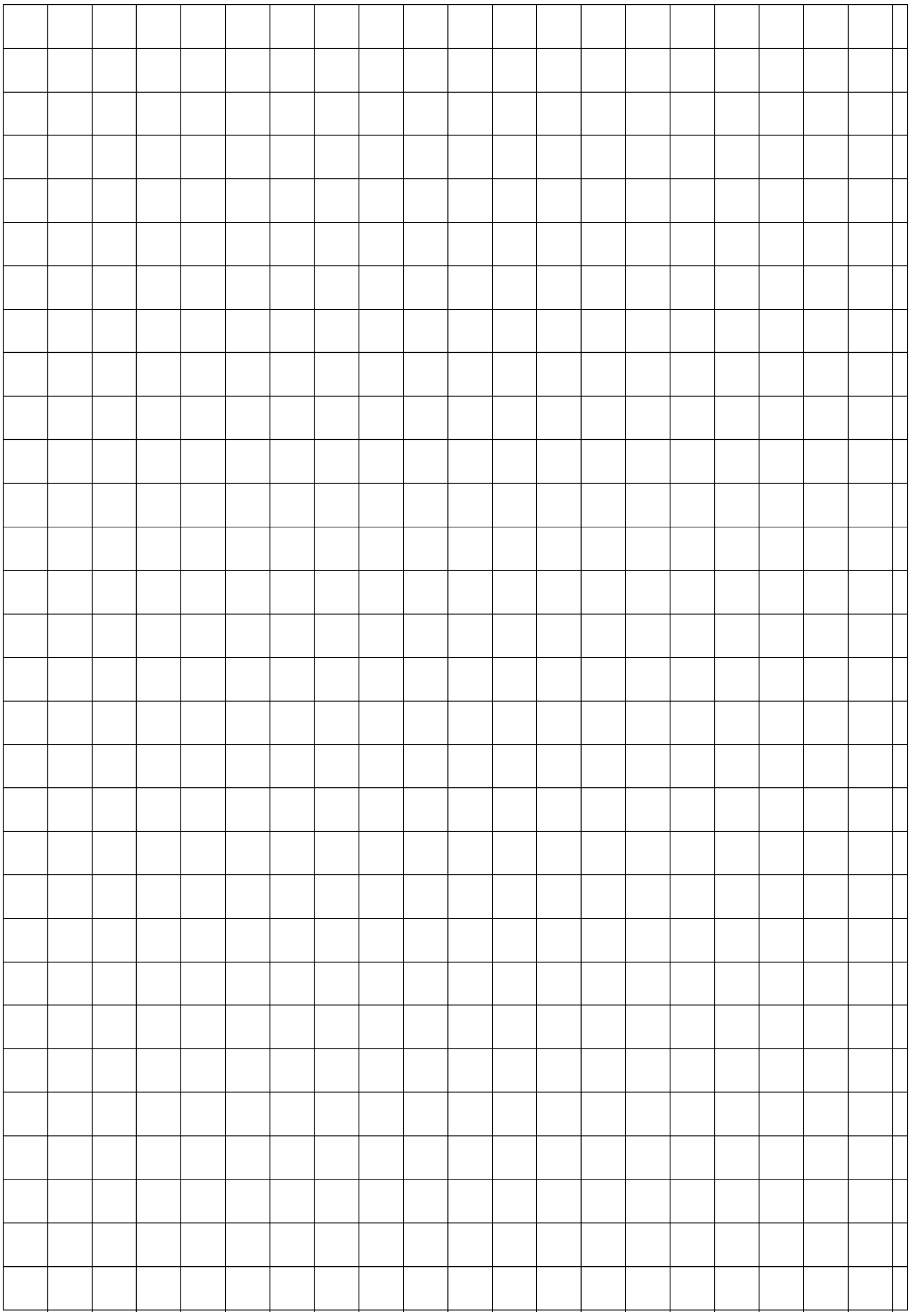
1. Platen roller

(Reference pattern)



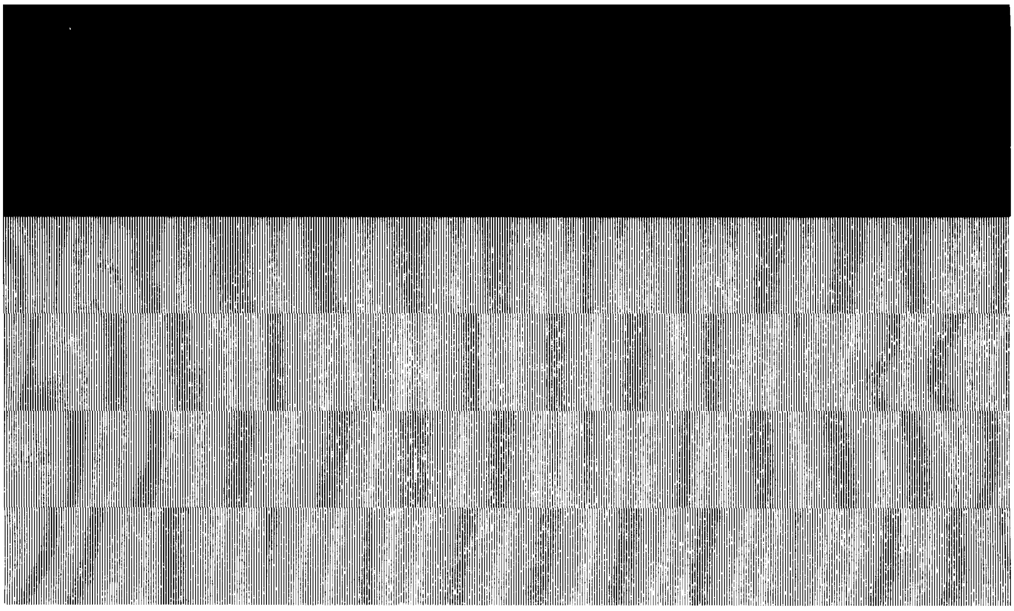
2. Left margin/Top margin

(Reference pattern)



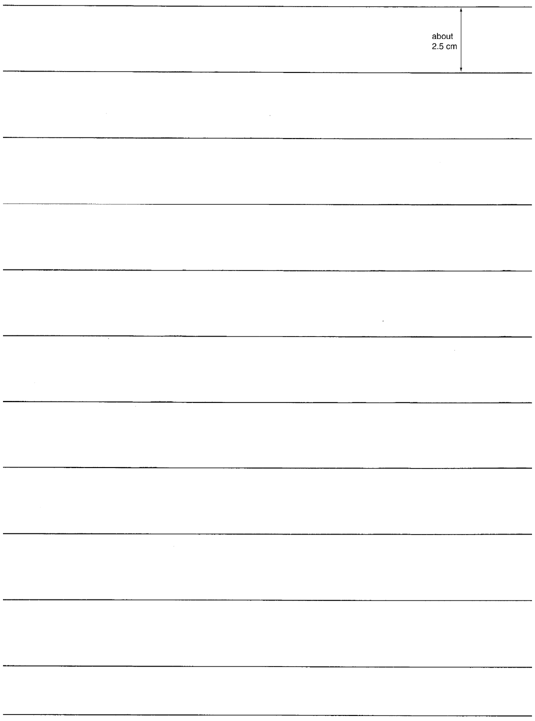
3. Thermal head 1 dot

(Reference pattern)



4. Use this test pattern to confirm the torque limiter for Ink film and platen roller timing.

(Reference pattern)



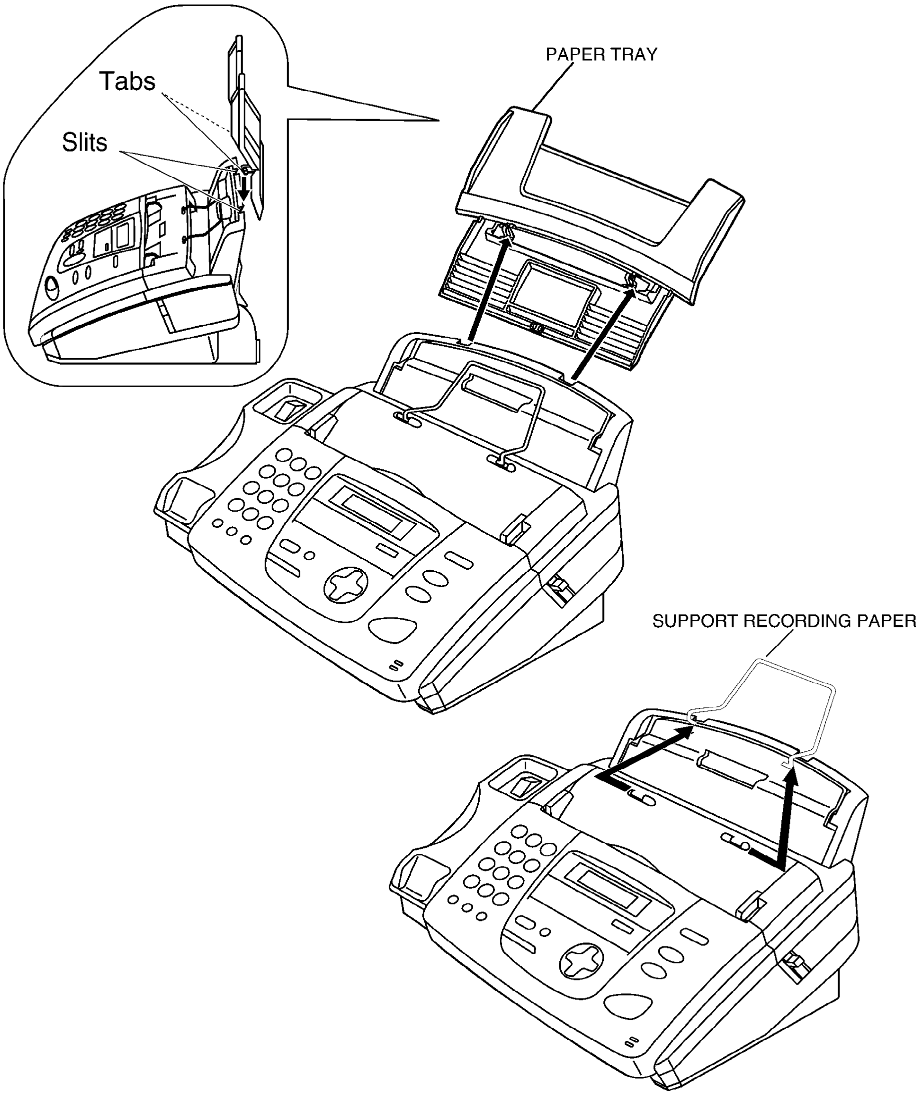
4. DISASSEMBLY INSTRUCTIONS

4.1. HOW TO REMOVE THE PAPER TRAY

Procedure: 1

REF No. 1

1)Pull up and remove the PAPER TRAY in the direction of the arrow.
2)Remove the SUPPORT RECORDING PAPER in the direction of the arrow.

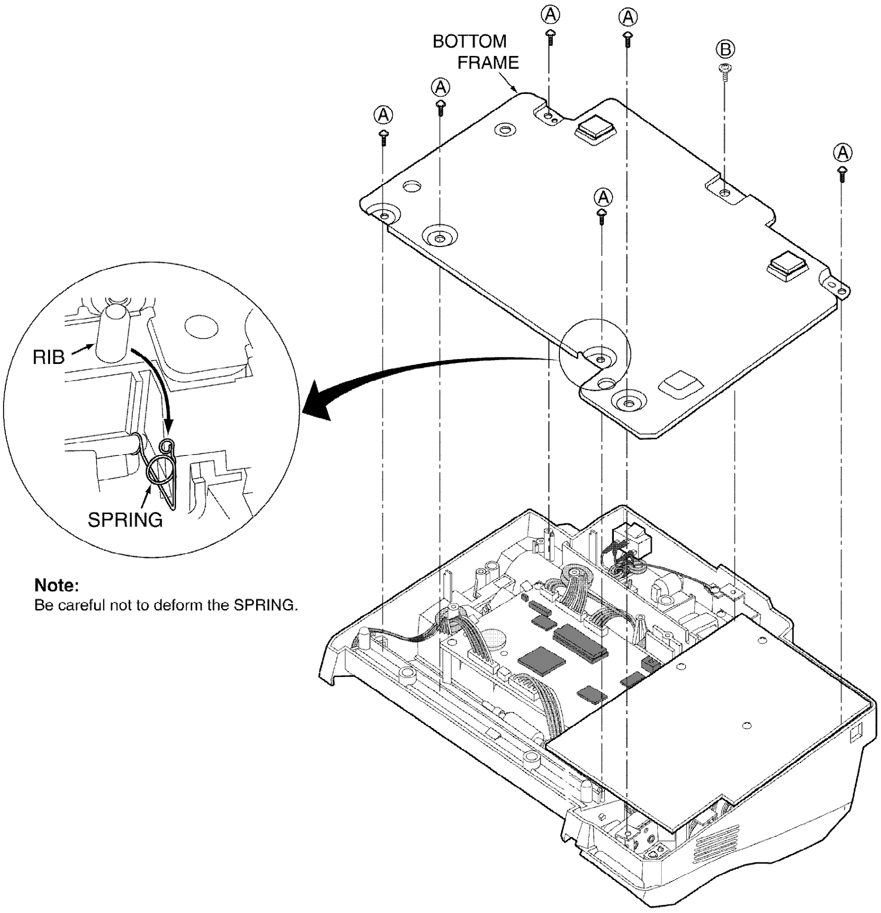

Tabs
Slits
PAPER TRAY
SUPPORT RECORDING PAPER

4.2. HOW TO REMOVE THE BOTTOM FRAME

Procedure: 2

REF No. 2

1) Remove the 6 screws Ⓐ.
2) Remove the 1 screw Ⓑ .
3) Remove the SPRING from the RIB.
4) Remove the BOTTOM FRAME.


BOTTOM FRAME
Ⓐ
Ⓑ
RIB
SPRING

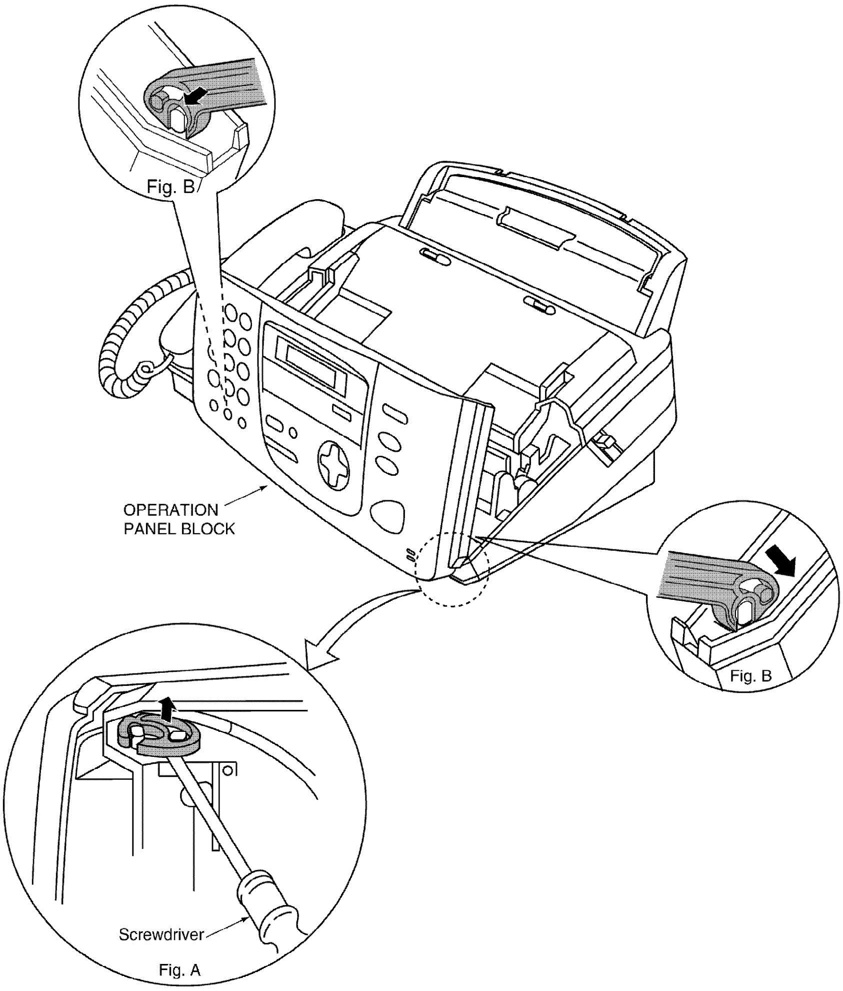
Note:
Be careful not to deform the SPRING.

4.3. HOW TO REMOVE THE OPERATION PANEL BLOCK

Procedure: 2-->3

REF No. 3

1) Unhook all the connectors connecting the main cabinet with the OPERATION PANEL BLOCK.
2) Open the OPERATION PANEL BLOCK by pulling up the center part.
3) Tilt the unit vertically so that its left side faces down the grey-shaded ARM as illustrated in Fig. A, insert a screwdriver and unlatch the ARM as illustrated in Fig. A.
4) Pull out both sides of the arms (in the direction of the arrow shown in Fig. B).
5) Remove the OPERATION PANEL BLOCK.



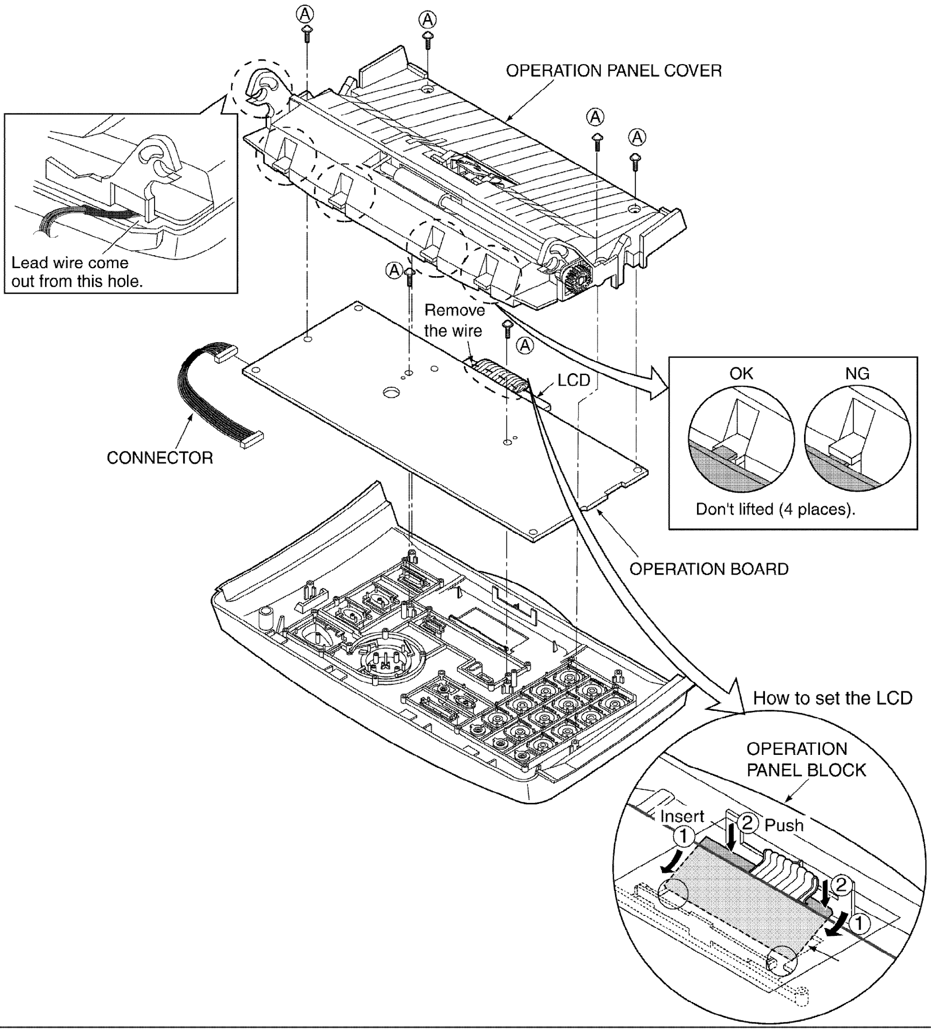
4.4. HOW TO REMOVE THE OPERATION BOARD AND LCD

Procedure: 2-->3-->4

REF No. 4

<OPERATION PANEL COVER>
1) Remove the 4 screws Ⓐ .
2) Remove the OPERATION PANEL COVER.

<OPERATION BOARD>
3) Remove the 2 screws Ⓐ.
4) Disconnect the CONNECTOR.
5) Remove the OPERATION BOARD.
6) Remove the wire for LCD.
7) Remove the LCD.


Ⓐ
OPERATION PANEL COVER
Lead wire come out from this hole.
Remove the wire
LCD
CONNECTOR
OK
NG
Don't lifted (4 places).
OPERATION BOARD
How to set the LCD
OPERATION PANEL BLOCK
Insert
①
②
Push

4.5. HOW TO REMOVE THE ANALOGUE, DIGITAL AND POWER BOARDS AND AC INLET

Procedure: 2-->5

REF No. 5

<ANALOGUE BOARD>

1) Remove the 3 screws Ⓐ and 1screw Ⓒ .
2) Disconnect the CONNECTORs-A.
3) Remove the ANALOGUE BOARD.

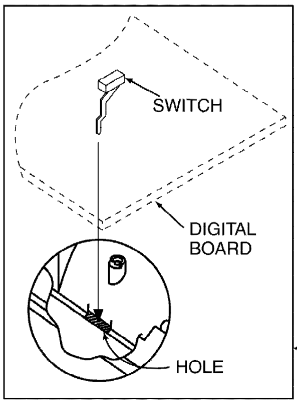
<DIGITAL BOARD>

4) Disconnect the CONNECTORs-B.
5) Remove the 4 screws Ⓐ .
6) Remove the DIGITAL BOARD.

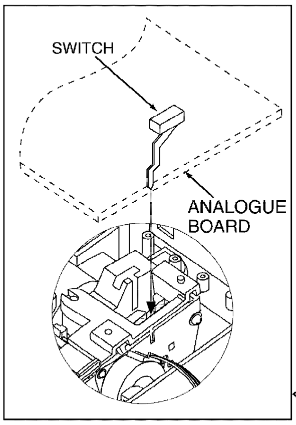
<POWER SUPPLY BOARD>

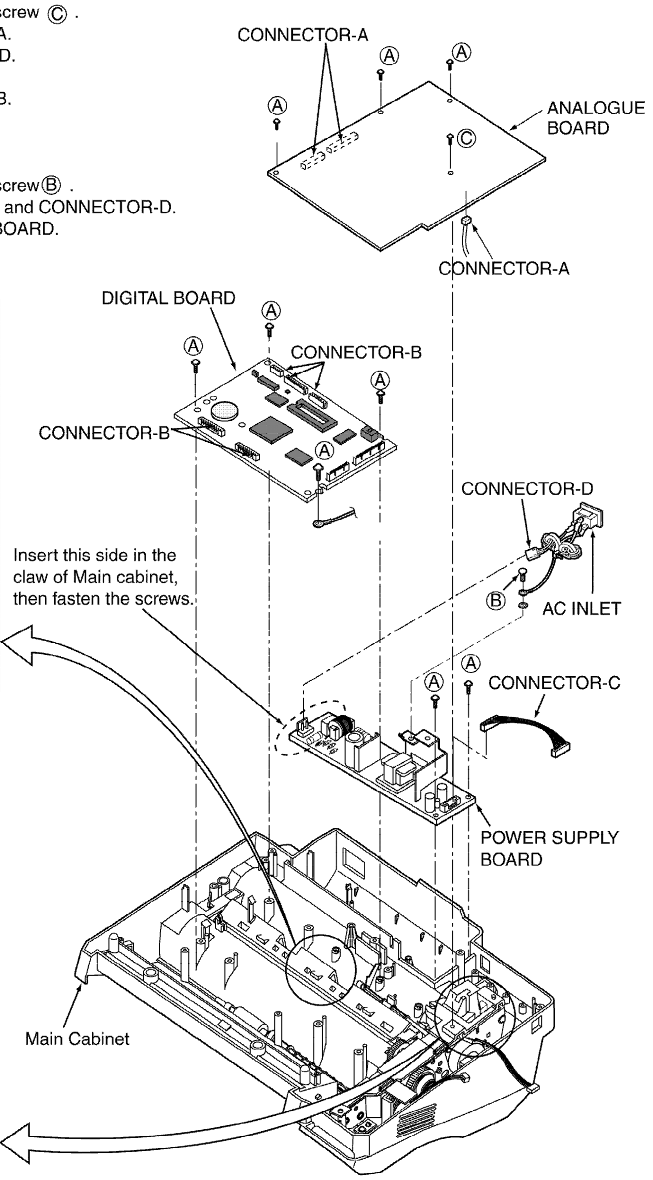
7) Remove the 2 screws Ⓐ and 1screwⒷ .
8) Disconnect the CONNECTOR-C and CONNECTOR-D.
9) Remove the POWER SUPPLY BOARD.
10) Remove the AC INLET.

SWITCH ON DIGITAL BOARD


SWITCH
DIGITAL BOARD
HOLE

SWITCH ON ANALOGUE BOARD


SWITCH
ANALOGUE BOARD


CONNECTOR-A
Ⓐ
Ⓐ
Ⓐ
ANALOGUE BOARD
Ⓒ
CONNECTOR-A
DIGITAL BOARD
Ⓐ
Ⓐ
CONNECTOR-B
Ⓐ
CONNECTOR-B
Ⓐ
CONNECTOR-D
Ⓑ
AC INLET
Ⓐ
Ⓐ
CONNECTOR-C
POWER SUPPLY BOARD
Main Cabinet

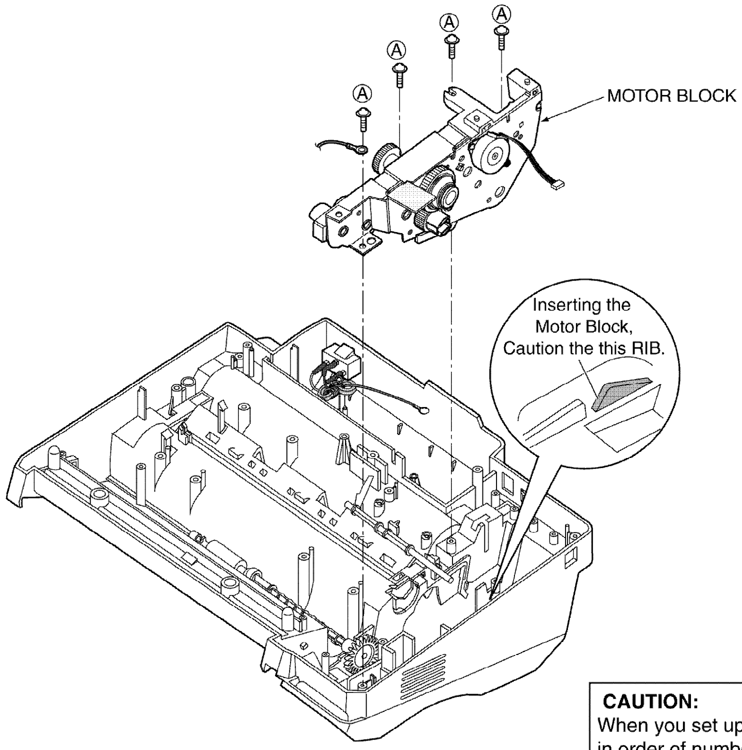
Insert this side in the claw of Main cabinet, then fasten the screws.

4.6. HOW TO REMOVE THE MOTOR BLOCK

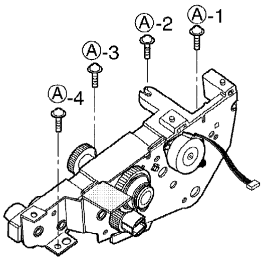
Procedure: 2-->5-->6(a)

REF No. 6(a)

1) Remove the 4 screws Ⓐ .
2) Remove the MOTOR BLOCK. [See **REF No. 6(b)**]


Ⓐ
Ⓐ
Ⓐ
Ⓐ
MOTOR BLOCK
Inserting the Motor Block, Caution the this RIB.

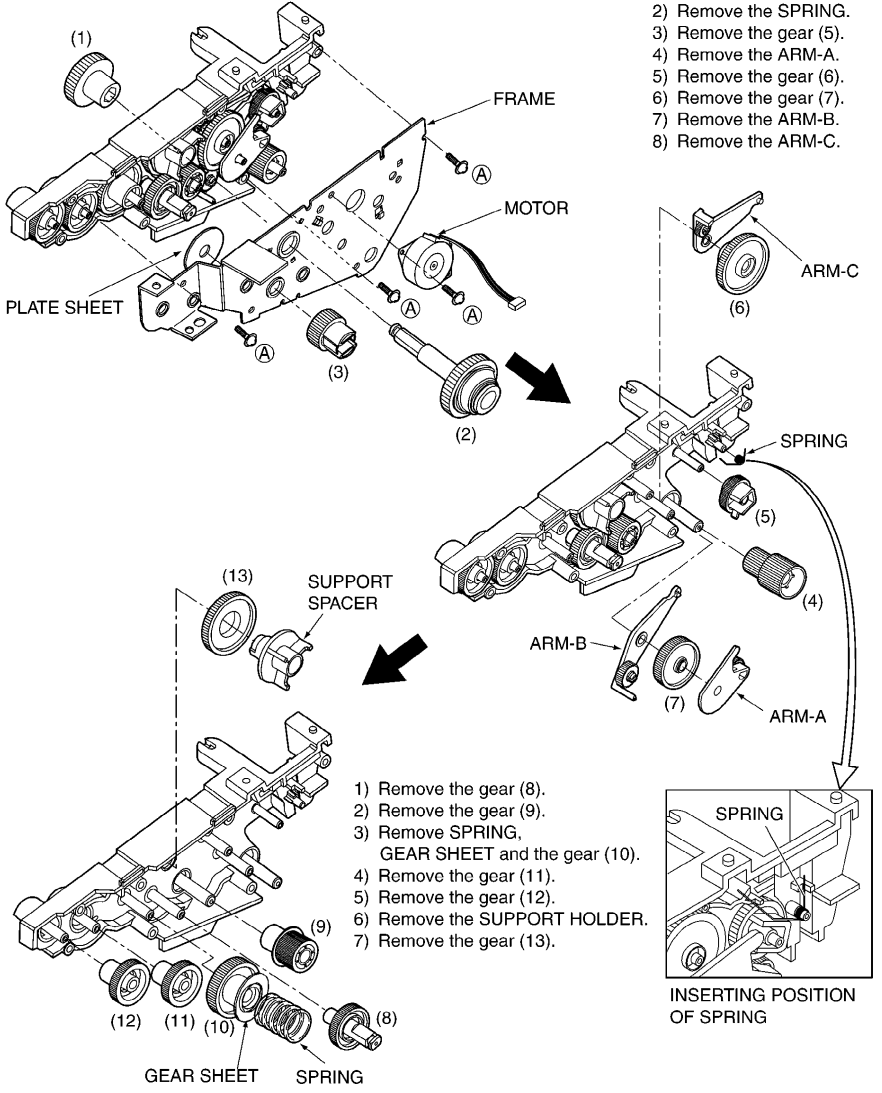
CAUTION:
When you set up, fasten these screws in order of number below.



Procedure: 2-->5-->6(a)-->6(b)

REF No. 6(b)

1) Remove the 4 screws Ⓐ.
2) Remove the MOTOR, FRAME and PLATE SHEET.
3) Remove the gear (1).
4) Remove the gear (2).
5) Remove the gear (3).


(1)
FRAME
Ⓐ
MOTOR
PLATE SHEET
Ⓐ
Ⓐ
Ⓐ
(3)
(2)
ARM-C
(6)
SPRING
(5)
(4)
(13)
SUPPORT SPACER
ARM-B
(7)
ARM-A
SPRING
INSERTING POSITION OF SPRING
(9)
(12)
(11)
(10)
(8)
GEAR SHEET
SPRING

1) Remove the gear (4).
2) Remove the SPRING.
3) Remove the gear (5).
4) Remove the ARM-A.
5) Remove the gear (6).
6) Remove the gear (7).
7) Remove the ARM-B.
8) Remove the ARM-C.

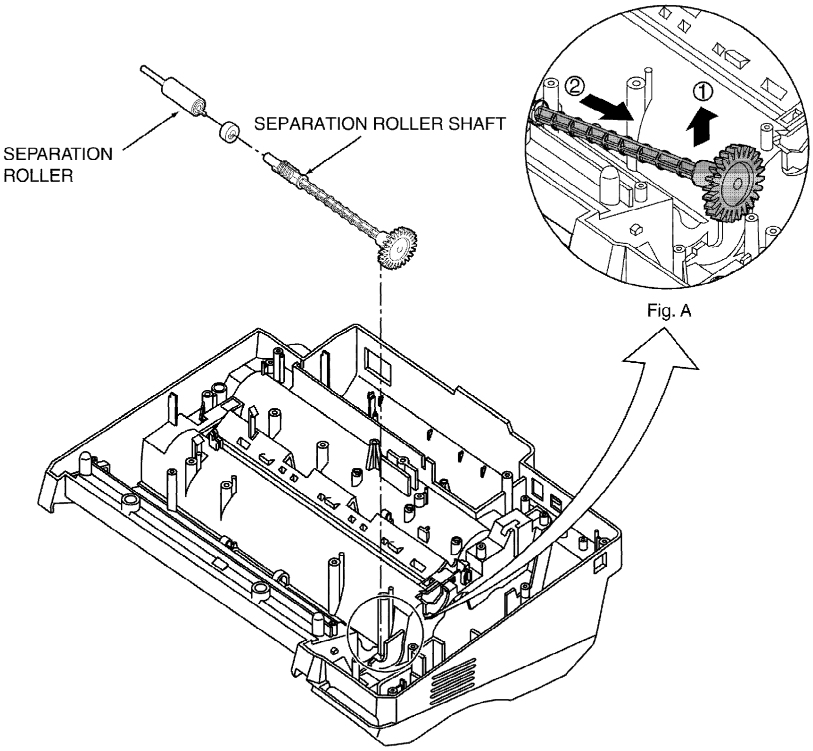
1) Remove the gear (8).
2) Remove the gear (9).
3) Remove SPRING,
   GEAR SHEET and the gear (10).
4) Remove the gear (11).
5) Remove the gear (12).
6) Remove the SUPPORT HOLDER.
7) Remove the gear (13).

4.7. HOW TO REMOVE THE SEPARATION ROLLER

Procedure: 2-->5-->6(a)-->7

REF No. 7

1) Remove the SEPARATON ROLLER and SHAFT (Fig. A).

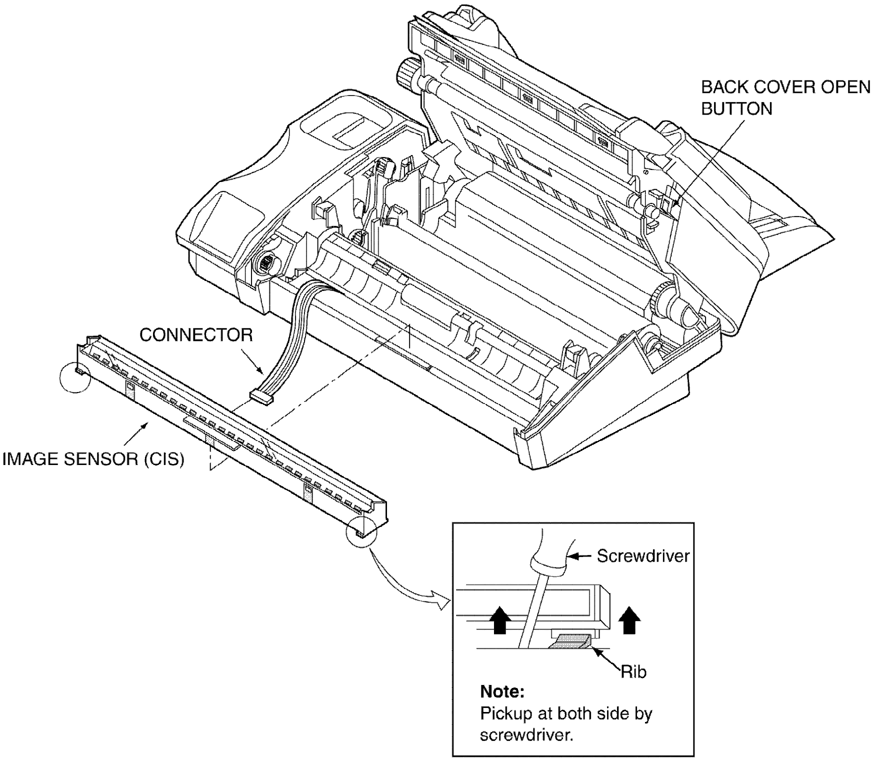

SEPARATION ROLLER
SEPARATION ROLLER SHAFT
②
①
Fig. A

4.8. HOW TO REMOVE THE IMAGE SENSOR (CIS)

Procedure: 2-->3-->5-->8

REF No. 8

1) Push the BACK COVER OPEN BUTTON to open back cover.
2) Remove the CONNECTOR.
3) Remove the IMAGE SENSOR as illustrated below.


BACK COVER OPEN BUTTON
CONNECTOR
IMAGE SENSOR (CIS)
Screwdriver
Rib

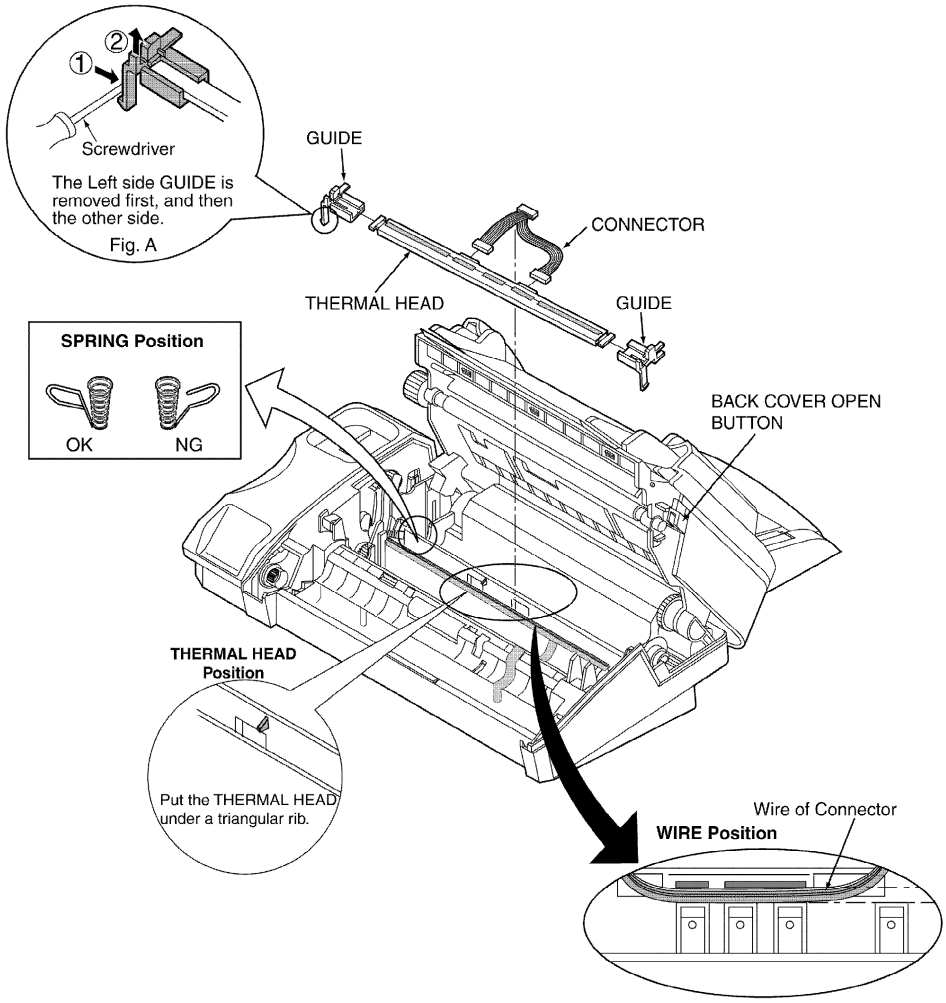
Note:
Pickup at both side by screwdriver.

4.9. HOW TO REMOVE THE TERMAL HEAD

Procedure: 2-->5-->9

REF No. 9

1) Push the BACK COVER OPEN BUTTON to open back cover.
2) Remove the two GUIDEs and CONNECTOR.
3) Remove the THERMAL HEAD.

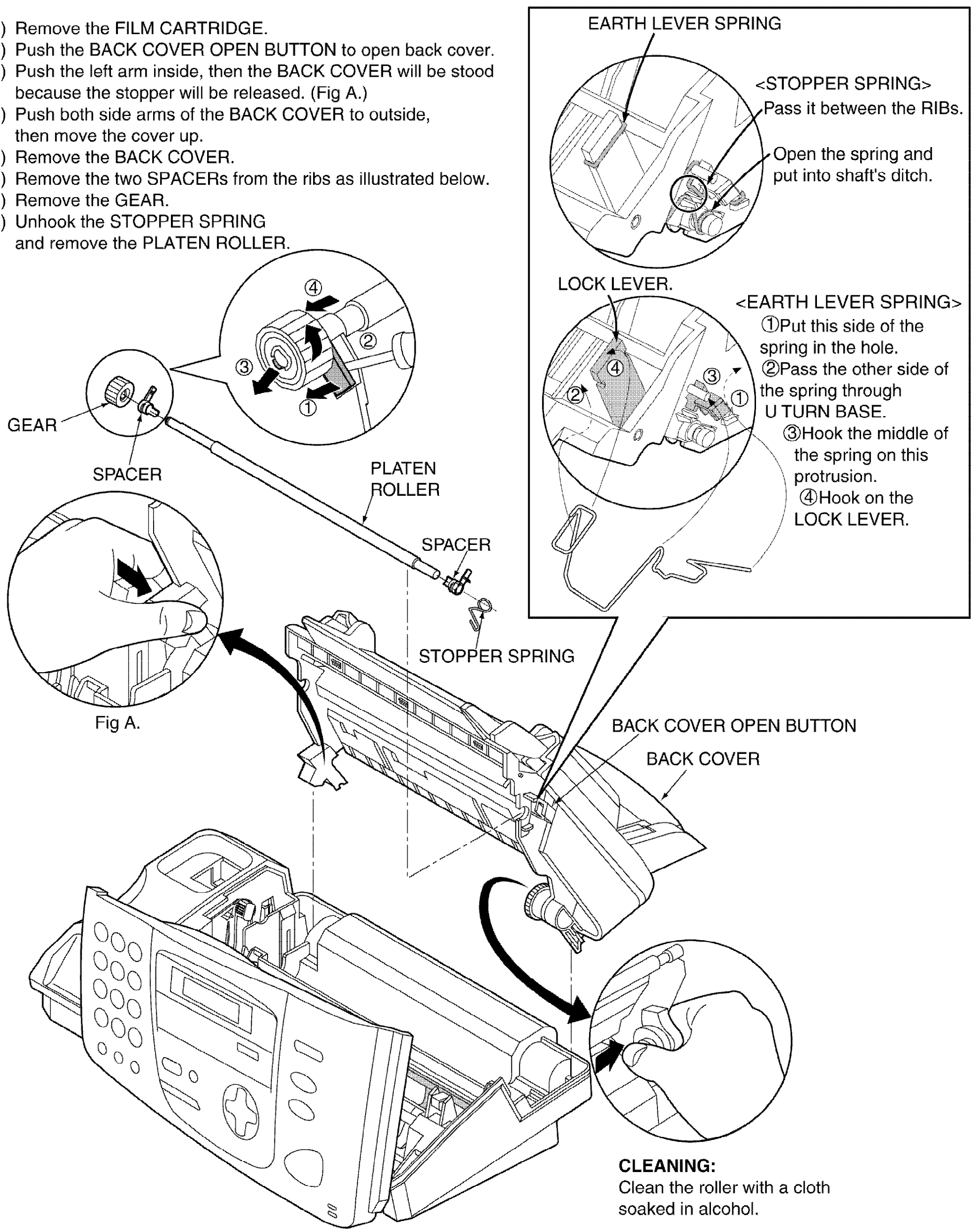

②
①
Screwdriver
The Left side GUIDE is removed first, and then the other side.
Fig. A
GUIDE
CONNECTOR
THERMAL HEAD
GUIDE
SPRING Position
OK
NG
BACK COVER OPEN BUTTON
THERMAL HEAD Position
Put the THERMAL HEAD under a triangular rib.
Wire of Connector
WIRE Position

4.10. HOW TO REMOVE THE PLATEN ROLLER, BACK COVER

Procedure:10

REF No. 10

1) Remove the FILM CARTRIDGE.
2) Push the BACK COVER OPEN BUTTON to open back cover.
3) Push the left arm inside, then the BACK COVER will be stood because the stopper will be released. (Fig A.)
4) Push both side arms of the BACK COVER to outside, then move the cover up.
5) Remove the BACK COVER.
6) Remove the two SPACERs from the ribs as illustrated below.
7) Remove the GEAR.
8) Unhook the STOPPER SPRING and remove the PLATEN ROLLER.


SPRING POSITION
EARTH LEVER SPRING
LOCK LEVER.
①
②
③
④
GEAR
SPACER
PLATEN ROLLER
SPACER
STOPPER SPRING
Fig A.
BACK COVER OPEN BUTTON
BACK COVER

<STOPPER SPRING>
Pass it between the RIBs.
Open the spring and put into shaft's ditch.

<EARTH LEVER SPRING>
①Put this side of the spring in the hole.
②Pass the other side of the spring through U TURN BASE.
③Hook the middle of the spring on this protrusion.
④Hook on the LOCK LEVER.

CLEANING:
Clean the roller with a cloth soaked in alcohol.

4.11. HOW TO REMOVE THE PICKUP ROLLER

Procedure:10-->11

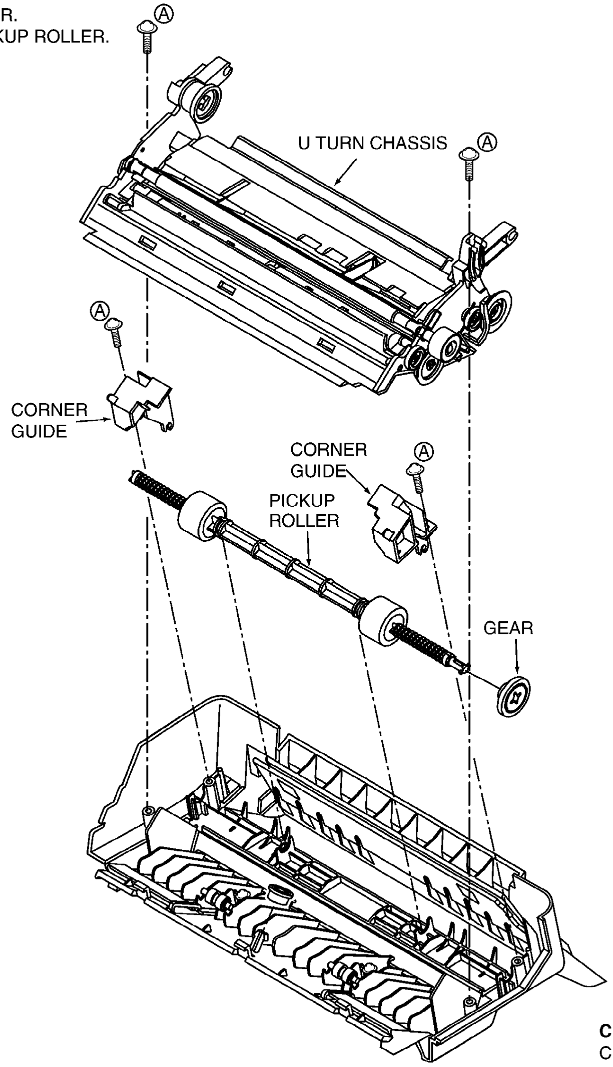
REF No. 11

<U TURN CHASSIS>

1) Remove the 2 screws Ⓐ .
2) Remove the U TURN CHASSIS.

<PICKUP ROLLER>

3) Remove the 2 screws Ⓐ .
4) Remove the 2 CORNERs.
5) Remove the GEAR.
6) Remove the PICKUP ROLLER.


Ⓐ
U TURN CHASSIS
Ⓐ
Ⓐ
CORNER GUIDE
CORNER GUIDE
Ⓐ
PICKUP ROLLER
GEAR

CLEANING:
Clean the roller with
a cloth soaked in alchol.

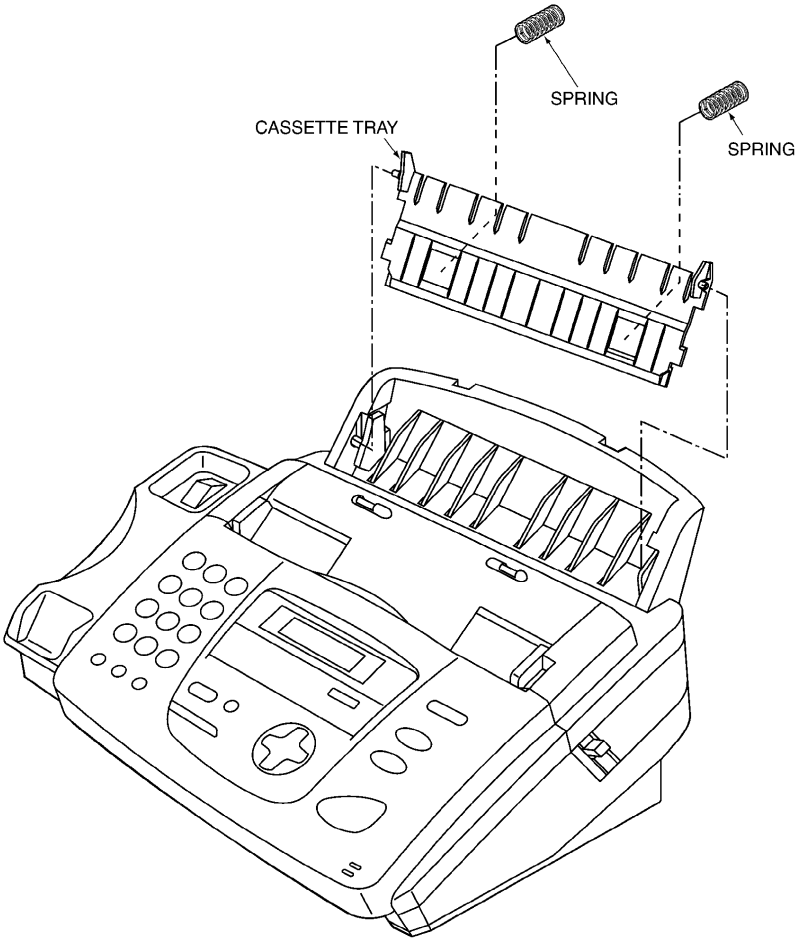
4.12. HOW TO REMOVE THE CASSETTE TRAY

Procedure: 12

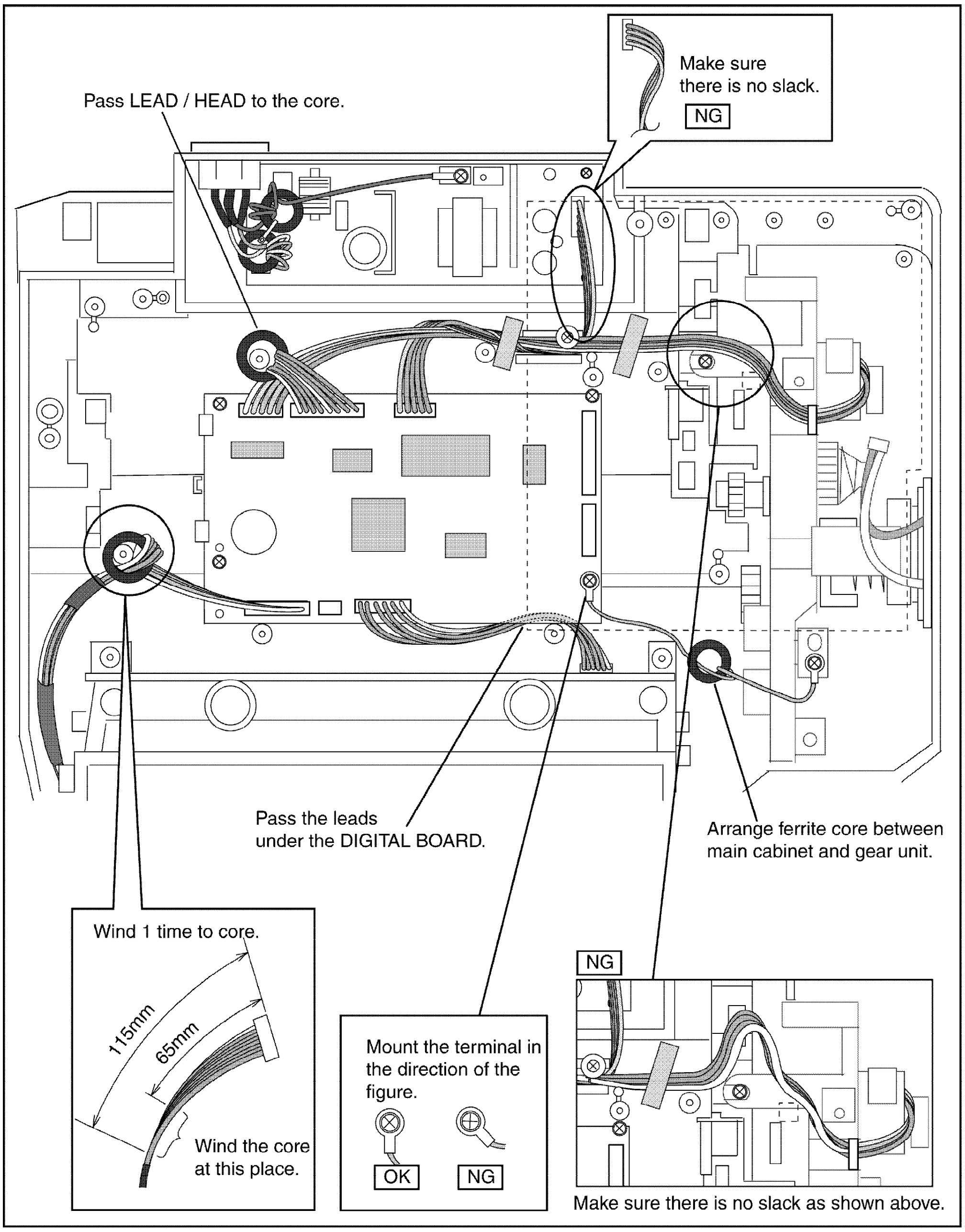
REF No. 12

1) Pull up and remove the CASSETTE TRAY in the direction of the arrow.

Note: Inserting the CASSETTE TRAY the to unit, then insert the two SPRINGs.


SPRING
CASSETTE TRAY
SPRING

4.13. INSTALLATION POSITION OF THE LEAD WIRES


Pass LEAD / HEAD to the core.
Make sure there is no slack.
NG
Pass the leads under the DIGITAL BOARD.
Arrange ferrite core between main cabinet and gear unit.
Wind 1 time to core.
115mm
65mm
Wind the core at this place.
Mount the terminal in the direction of the figure.
OK
NG
NG
Make sure there is no slack as shown above.

5. HOW TO REPLACE THE FLAT PACKAGE IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

5.1. PREPARATION

- SOLDER

Sparkle Solder 115A-1, 115B-1 OR Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption is between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)

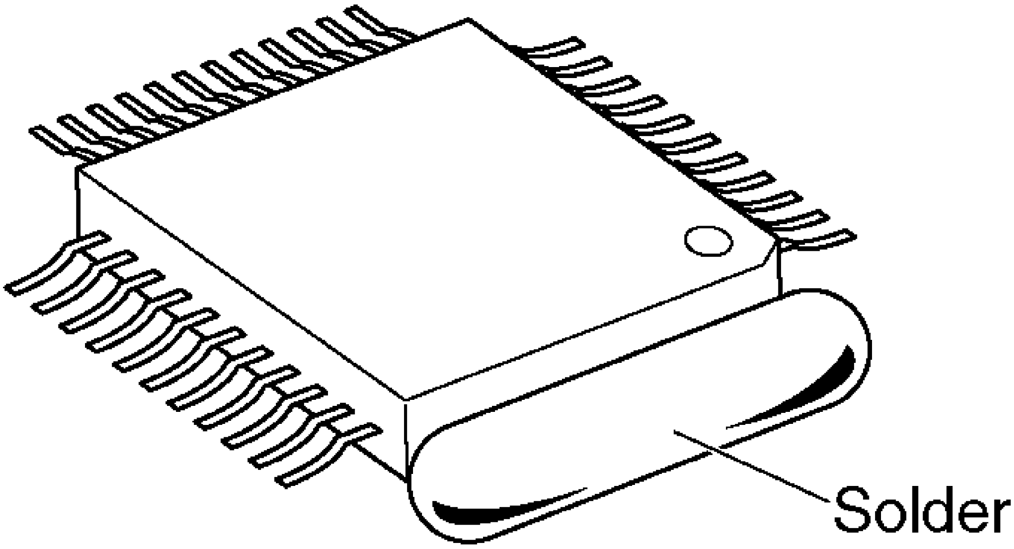
- Flux

HI115 Specific gravity 0.863
(Original flux should be replaced daily.)

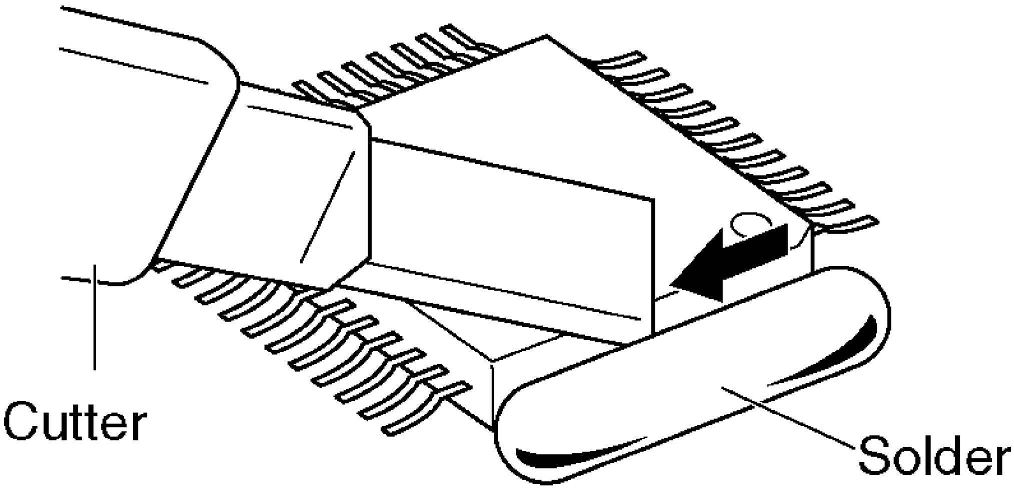
5.2. FLAT PACKAGE IC REMOVAL PROCEDURE

1. Put plenty of solder on the IC pins so that the pins can be completely covered.

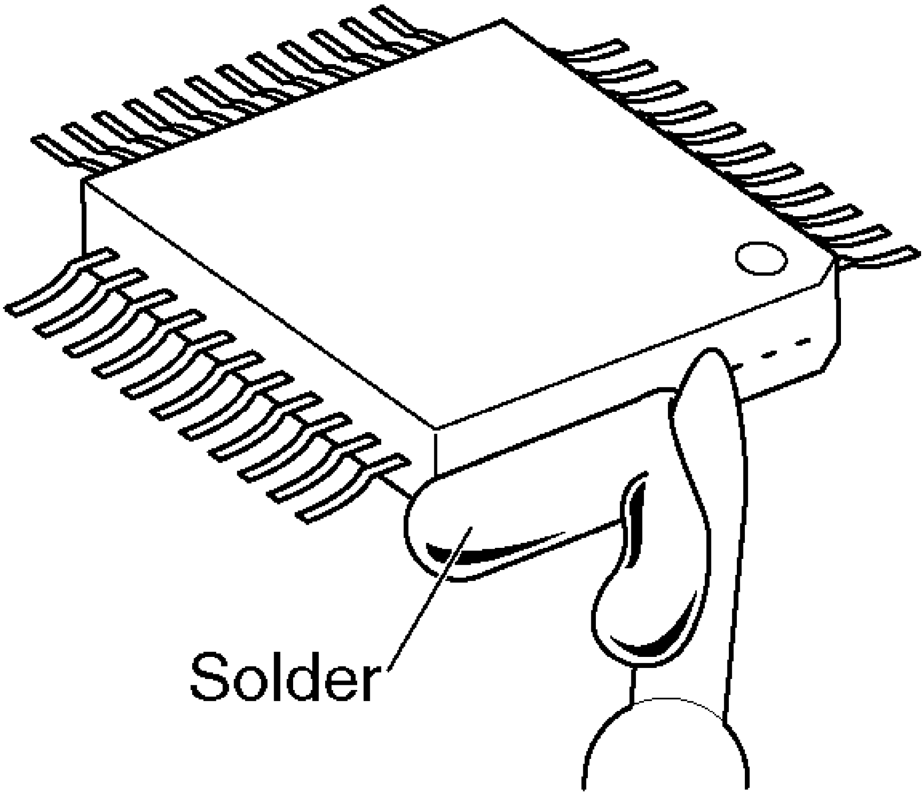
Note:
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.



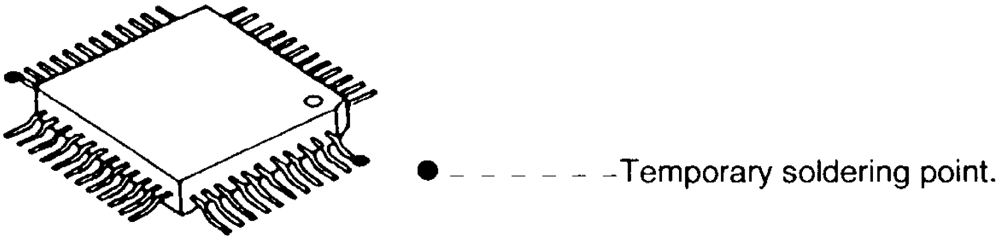
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

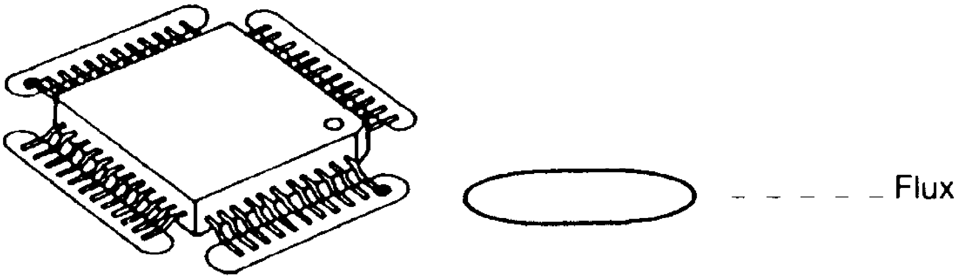
5.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

1. Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.

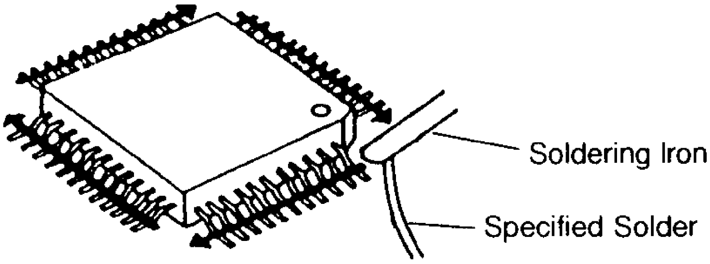

● - - - - - -Temporary soldering point.

***Check the accuracy of the IC setting with the corresponding soldering foil.**

2. Apply flux to all pins of the FLAT PACKAGE IC.



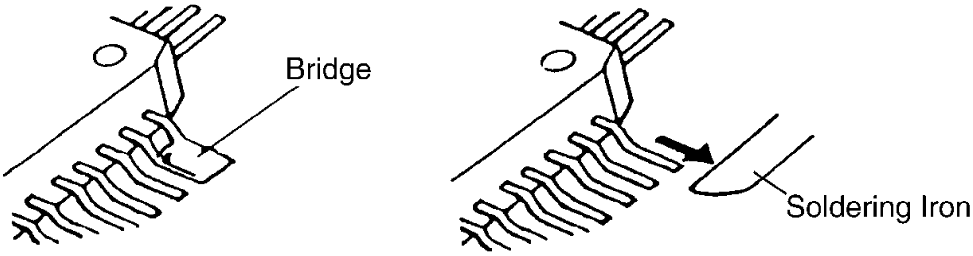
3. Solder the pins, sliding the soldering iron in the direction of the arrow.


Soldering Iron
Specified Solder

5.4. BRIDGE MODIFICATION PROCEDURE

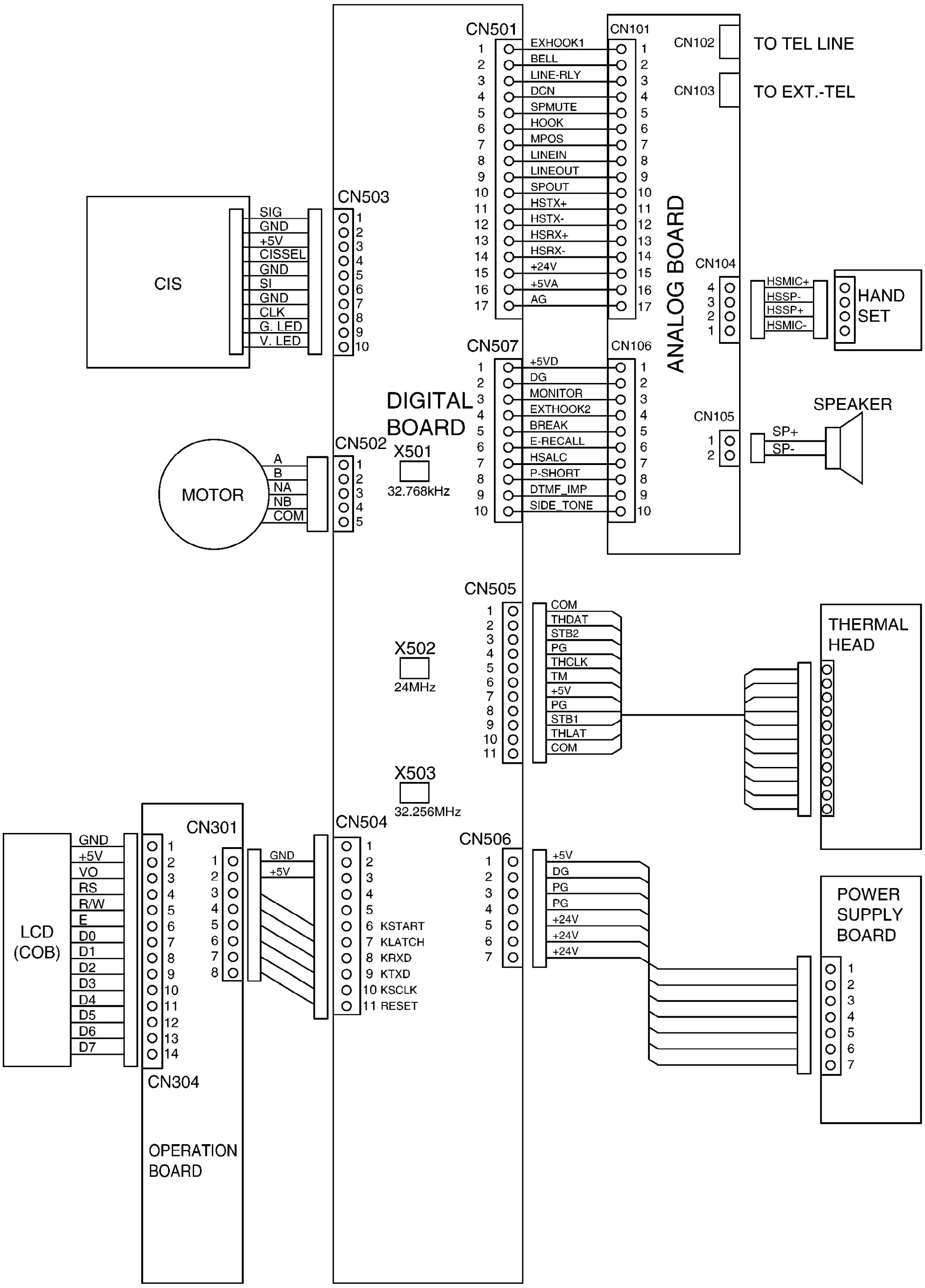
1. Lightly resolder the bridged portion.

2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.


Bridge
Soldering Iron

6. CIRCUIT OPERATIONS

6.1. CONNECTION DIAGRAM


CIS
SIG
GND
+5V
CISSEL
GND
SI
GND
CLK
G. LED
V. LED
CN503
DIGITAL BOARD
CN501
EXHOOK1
BELL
LINE-RLY
DCN
SPMUTE
HOOK
MPOS
LINEIN
LINEOUT
SPOUT
HSTX+
HSTX-
HSRX+
HSRX-
+24V
+5VA
AG
CN101
ANALOG BOARD
CN102
TO TEL LINE
CN103
TO EXT.-TEL
CN104
HSMIC+
HSSP-
HSSP+
HSMIC-
HAND SET
CN507
+5VD
DG
MONITOR
EXTHOOK2
BREAK
E-RECALL
HSALC
P-SHORT
DTMF_IMP
SIDE_TONE
CN106
CN105
SPEAKER
SP+
SP-
MOTOR
A
B
NA
NB
COM
CN502
X501
32.768kHz
CN505
COM
THDAT
STB2
PG
THCLK
TM
+5V
PG
STB1
THLAT
COM
THERMAL HEAD
X502
24MHz
X503
32.256MHz
CN504
6 KSTART
7 KLATCH
8 KRXD
9 KTXD
10 KSCLK
11 RESET
CN506
+5V
DG
PG
PG
+24V
+24V
+24V
POWER SUPPLY BOARD
LCD (COB)
GND
+5V
VO
RS
R/W
E
D0
D1
D2
D3
D4
D5
D6
D7
CN301
GND
+5V
CN304
OPERATION BOARD

6.2. GENERAL BLOCK DIAGRAM

The following is an outline of each device IC on the digital board. (Refer to GENERAL BLOCK DIAGRAM().).

1. **ASIC (IC501)**

   Composed mainly of an address decoder and a modem control.
   Controls the general FAX operations.
   Controls the operation panel I/F.
   Controls the thermal head I/F and CIS I/F.
   Performs the image processing.
   CPU and Real time clock
   Provides the reset pulse for each of the major ICs.

2. **ROM (IC502)**

   Contains all of the program instructions on the unit operations.

3. **Static RAM (IC504)**

   This memory is used mainly for the parameter working in the storage area.

4. **Dynamic RAM (IC503)**

   This memory is used mainly for the parameter working in the storage area.

5. **MODEM (IC515)**

   Performs the modulation and the demodulation for FAX communication.

6. **Read Section**

   CIS image sensor to read transmitted documents.

7. **Motor Driver (IC508)**

   Drives the transmission motor and the reception motor.

8. **Thermal Head**

   Contains heat-emitting elements for dot matrix image printing.

9. **Analogue Board**

   Composed of ITS circuit and NCU circuit.

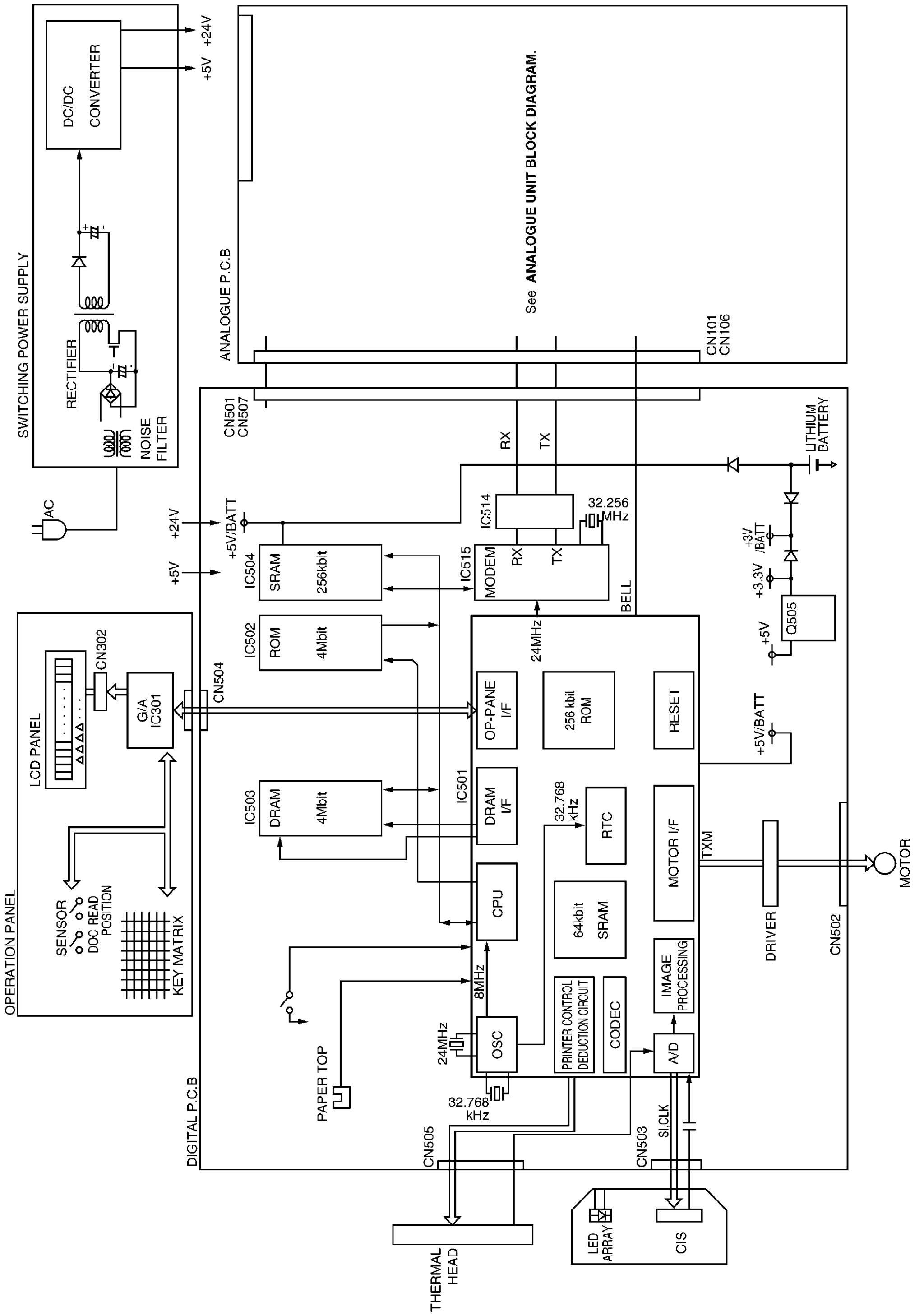
10. **Sensor Section**

    Composed of a cover open and film end switch, a document set switch, a document top switch, a paper top sensor and a motor position switch.

11. **Power Supply Board Switching Section**

Supplies +5V and +24V to the unit.

6.2.1. GENERAL BLOCK DIAGRAM


SWITCHING POWER SUPPLY
DC/DC CONVERTER
RECTIFIER
NOISE FILTER
AC
+5V
+24V
ANALOGUE P.C.B
See ANALOGUE UNIT BLOCK DIAGRAM.
CN101
CN106
CN501
CN507
RX
TX
LITHIUM BATTERY
+24V
+5V
+5V/BATT
IC514
32.256 MHz
IC504
SRAM
256kbit
IC515
MODEM
RX
TX
BELL
+3V /BATT
+3.3V
+5V
Q505
OPERATION PANEL
LCD PANEL
CN302
G/A IC301
CN504
IC502
ROM
4Mbit
24MHz
OP-PANE I/F
256 kbit ROM
RESET
+5V/BATT
SENSOR
DOC READ POSITION
KEY MATRIX
IC503
DRAM
4Mbit
IC501
DRAM I/F
32.768 kHz
RTC
MOTOR I/F
TXM
DRIVER
CN502
MOTOR
CPU
64kbit SRAM
8MHz
IMAGE PROCESSING
PAPER TOP
24MHz
OSC
PRINTER CONTROL DEDUCTION CIRCUIT
CODEC
A/D
32.768 kHz
DIGITAL P.C.B
CN505
CN503
SI.CLK
THERMAL HEAD
LED ARRAY
CIS

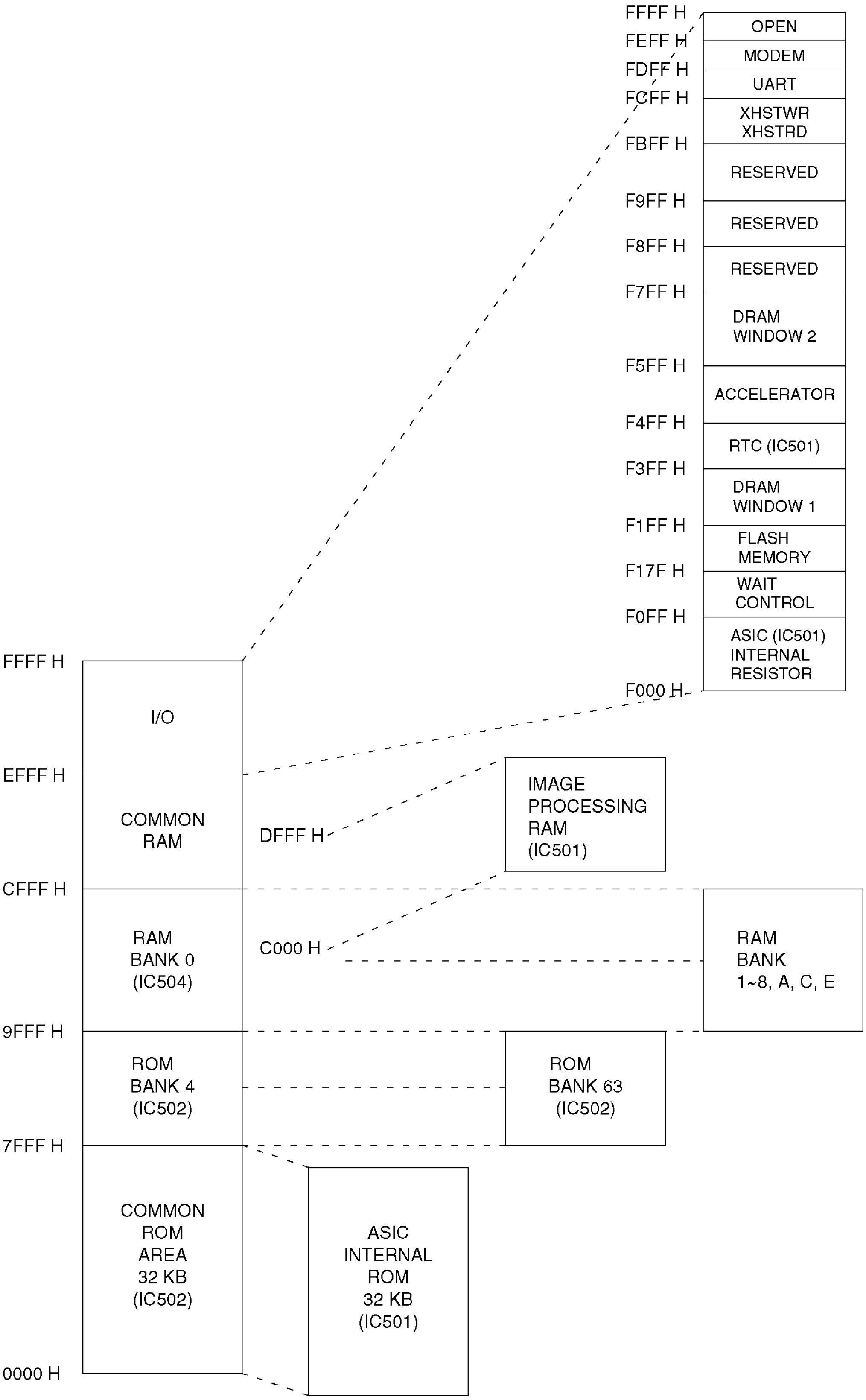
CROSS REFERENCE:

ANALOGUE UNIT BLOCK DIAGRAM()

6.3. CONTROL SECTION

6.3.1. BLOCK DIAGRAM

6.3.2. MEMORY MAP

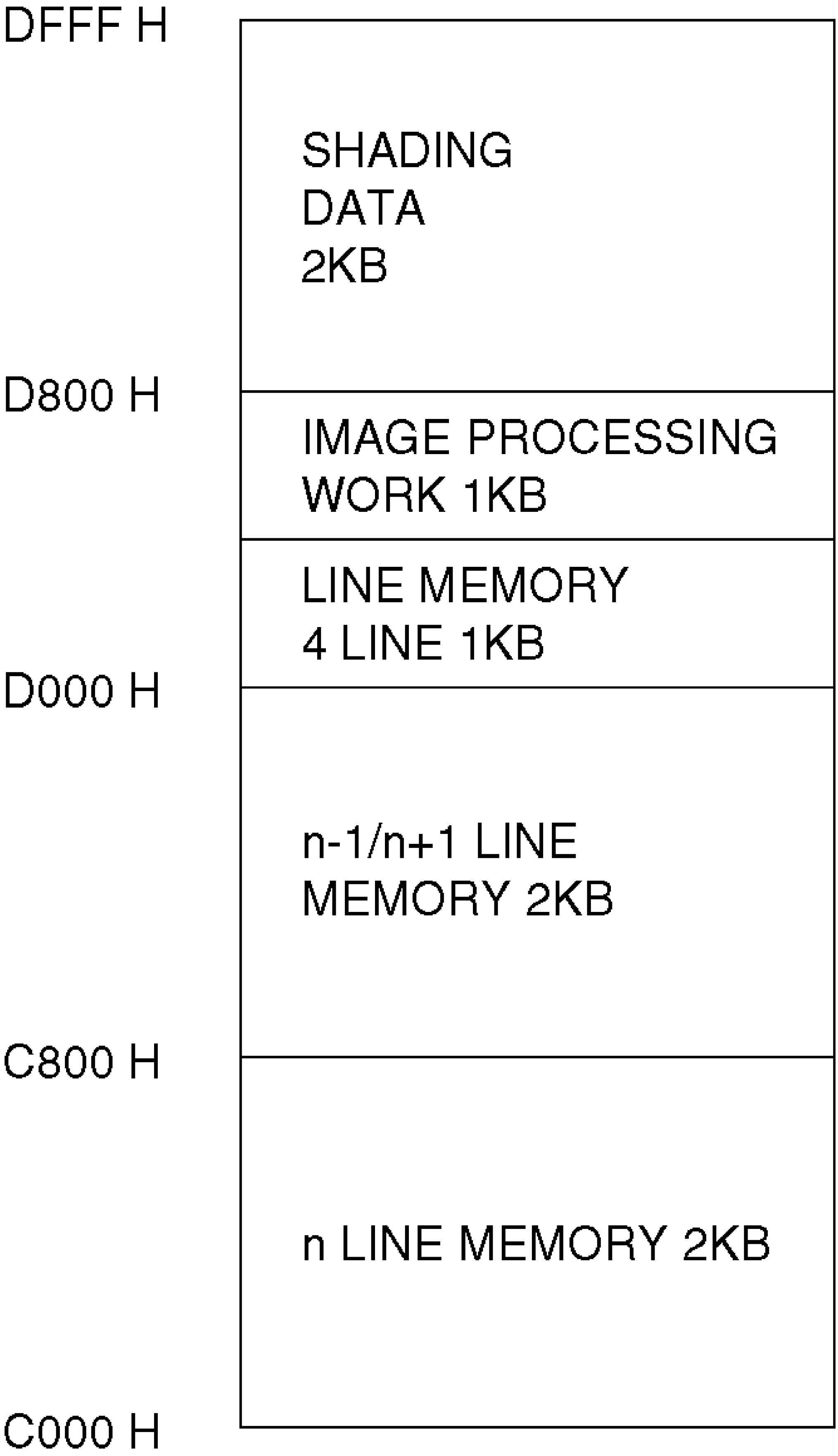

FFFF H
FEFF H
FDFF H
FCFF H
FBFF H
F9FF H
F8FF H
F7FF H
F5FF H
F4FF H
F3FF H
F1FF H
F17F H
F0FF H
F000 H
OPEN
MODEM
UART
XHSTWR
XHSTRD
RESERVED
RESERVED
RESERVED
DRAM
WINDOW 2
ACCELERATOR
RTC (IC501)
DRAM
WINDOW 1
FLASH
MEMORY
WAIT
CONTROL
ASIC (IC501)
INTERNAL
RESISTOR
FFFF H
I/O
EFFF H
COMMON
RAM
DFFF H
IMAGE
PROCESSING
RAM
(IC501)
CFFF H
RAM
BANK 0
(IC504)
C000 H
RAM
BANK
1~8, A, C, E
9FFF H
ROM
BANK 4
(IC502)
ROM
BANK 63
(IC502)
7FFF H
COMMON
ROM
AREA
32 KB
(IC502)
ASIC
INTERNAL
ROM
32 KB
(IC501)
0000 H

6.3.3. ASIC (IC501)

This custom IC is used for the general FAX operations.

1. **CPU:**
   This model uses a Z80 equivalent to the CPU operating at 12 MHz. Most of the peripheral functions are performed by custom-designed LSIs. Therefore, the CPU only works for processing the results.
2. **RTC:**
   Real Time Clock
3. **DECODER:**
   Decodes the address.
4. **ROM/RAM I/F:**
   Controls the SELECT signal of ROM or RAM and the bank switching.
5. **CIS I/F:**
   Controls the document reading.
6. **IMAGE DATA RAM:**
   This memory is programmed into the ASIC and uses 8 KB for the image processing. (See Fig. A.*)
7. **THERMAL HEAD I/F:**
   Transmits the recorded data to the thermal head.
8. **MOTOR I/F:**
   Controls the transmission motor which feeds the document.
   Controls the receiving motor which feeds the recording paper.
9. **OPERATION PANEL I/F:**
   Serial interface with Operation Panel.
10. **I/O PORT:**
    I/O Port Interface.
11. **ANALOGUE UNIT:**
    Electronic volume for the monitor.
    Sends beep tones, etc.

Fig. A


DFFF H
SHADING DATA 2KB
D800 H
IMAGE PROCESSING WORK 1KB
LINE MEMORY 4 LINE 1KB
D000 H
n-1/n+1 LINE MEMORY 2KB
C800 H
n LINE MEMORY 2KB
C000 H

(CPU ADDRESS)

Note*:
This memory is incorporated into the ASIC (IC501) and used for the image processing.
Fig. A shows the memory map of the Image Data RAM.

6.3.4. ROM (IC502)

This 512KB ROM (EPROM or MASKROM) carries a common area of 32KB and bank areas which each have 8KB (BK4~BK63). The addresses from 0000H to 7FFFH are for the common area and from 8000H to 9FFFH are for the bank areas.

6.3.5. STATIC RAM (IC504)

This 32KB RAM carries a common area of 8KB and bank areas which each have 12KB. The addresses from 0000H to EFFFH are for the common area and from A000H to CFFFH are for the bank area.

6.3.6. DYNAMIC RAM (IC503)

The DRAM serves as CPU and receives memory.
The address is F200H~F3FFH (DRAM access window 1) and F600H~F7FFH (DRAM access window 2).

Descriptions of Pin Distribution (IC501)

NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
1	AIN1	A	3.3V	CCD IMAGE SIGNAL INPUT
2	AIN2	A	3.3V	THERMISTOR TEMPERATURE WATC INPUT
3	AIN3	A	3.3V	-----------
4	AMON	A	3.3V	ANALOGUE SIGNAL MONITOR TERMINAL
5	VSSB		GND	POWER SOURCE (ANALOGUE GND)
6	VDDB		3.3V	POWER SOURCE (ANALOGUE +3.3V
7	VDD(3.3V/B)		3.3V/BATT	POWER SOURCE (+3.3V/LITHIUM BATTERY)
8	X32OUT	O	3.3V/BATT	RTC (32.768KHz) CONNECTION
9	X32IN	I	3.3V/BATT	RTC (32.768KHz) CONNECTION
10	VSS		GND	GND
11	XBACEN	I	5V/BATT	BACKUP ENABLE
12	VDD (5V/B)		5V/BATT	POWER SOURCE (+5V/LITHIUM BATTERY)
13	XRAMCS	O	5V/BATT	RAM (IC504) CHIP SELECT
14	FTG	O	5V	SH SIGNAL OUTPUT FOR CIS (SI)
15	F1	O	5V	01 SIGNAL OUTPUT FOR CIS (CLK)
16	F2/OP	O	5V	OUTPUT PORT (BREAK)
17	FR/OP	O	5V	OUTPUT PORT (E-RECALL)
18	CPC	I	5V	INPUT PORT (CISSEL)
19	VDD (5V)		5V	POWER SOURCE (+5V)
20	VSS		GND	POWER SOURCE (GND)
21	RVN	I	5V	INPUT PORT (MPOS)
22	IRDATXD/IOP	O	5V	OUTPUT PORT (CISON)
23	IRDARXD/IOP80	O	5V	OUTPUT PORT (THON)
24	TXD/IOP	O	5V	OUTPUT PORT (DTMF-IMP)
25	RXD/IOP	O	5V	OUTPUT PORT (VOX)
26	XRTS/IOP	O	5V	OUTPUT PORT (P-SHORT)
27	XCTS/IOP	O	5V	OUTPUT PORT (HOOK)
28	MIDAT/IOP	O	5V	OUTPUT PORT (MDAT)
29	MICLK/IOP	O	5V	OUTPUT PORT (MCLK)
30	TONE1	A	5V	TONE OUTPUT
31	TONE2	A	5V	TONE OUTPUT
32	VOLUREF	A	5V	ANALOGUE REF VOLTAGE
33	VOLUOUT	A	5V	VOLUME OUTPUT
34	VOLUIN	A	5V	VOLUME INPUT
35	MILAT/IOP	I	5V	INPUT PORT (MLAT)
36	XNMI	I	5V	HIGH FIXED
37	FMEMDO/IOP	O	5V	OUTPUT PORT (CISLED)
38	FMEMDI/IOP	O	5V	OUTPUT PORT (LINERLY)

NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
39	FMEMCLK/IOP	I	5V	INPUT PORT (BELL)
40	VSS		GND	POWER SOURCE (GND)
41	VDD (5V)		5V	POWER SOURCE (+5V)
42	20KOSC/IOP	I	5V	INPUT PORT (EXTHOOK)
43	XWAIT	I	5V	INPUT PORT (FILMEND)
44	HSTRD/IOP	I	5V	INPUT PORT (PTOP)
45	HSTWR/IOP	O	5V	OUTPUT PORT (SENLEDON)
46	XOPRBE	O	5V	OPRESET
47	ADR15	O	5V	CPU ADDRESS BUS 15 (NOT USED)
48	ADR14	O	5V	CPU ADDRESS BUS 14 (NOT USED)
49	ADR13	O	5V	CPU ADDRESS BUS 13 (NOT USED)
50	VDD (3.3V)		3.3V	POWER SOURCE (+3.3V)
51	XOUT	O	3.3V	SYSTEM CLOCK (24MHz)
52	XIN	I	3.3V	SYSTEM CLOCK (24MHz)
53	VSS		GND	POWER SOURCE (GND)
54	VDD (5V)		5V	POWER SOURCE (+5V)
55	XTEST	O	5V	24MHz CLOCK
56	TEST1	I	5V	HIGH FIXED
57	TEST2	I	5V	HIGH FIXED
58	TEST3	I	5V	HIGH FIXED
59	TEST4	I	5V	HIGH FIXED
60	XMDMINT	I	5V	MODEM INTERRUPT
61	XMDMCS	O	5V	MODEM CHIP SELECT
62	VSS		GND	POWER SOURCE (GND)
63	VDD (3.3V)		3.3V	POWER SOURCE (3.3V)
64	XRAS/IOP	O	5V	DRAM (IC503) ROW ADDRESS STRO
65	XCAS1/IOP	O	5V	DRAM (IC503) CULUM ADDRESS STROBE
66	XCAS2/IOP	O	5V	OUTPUT PORT (SPMUTE)
67	XRESCS2	O	5V	NOT USED
68	DB3	I/O	5V	CPU DATA BUS 3
69	DB2	I/O	5V	CPU DATA BUS 2
70	DB4	I/O	5V	CPU DATA BUS 4
71	DB1	I/O	5V	CPU DATA BUS 1
72	DB5	I/O	5V	CPU DATA BUS 5
73	DB0	I/O	5V	CPU DATA BUS 0
74	DB6	I/O	5V	CPU DATA BUS 6
75	VSS		GND	POWER SOURCE (GND)
76	VDD (3.3V)		3.3V	POWER SOURCE (3.3V)
77	DB7	I/O	5V	CPU DATA BUS 7
78	XROMCS	I/O	5V	ROM (IC502) CHIP SELECT
79	RD	O	5V	CPU RD
80	WR	O	5V	CPU WR

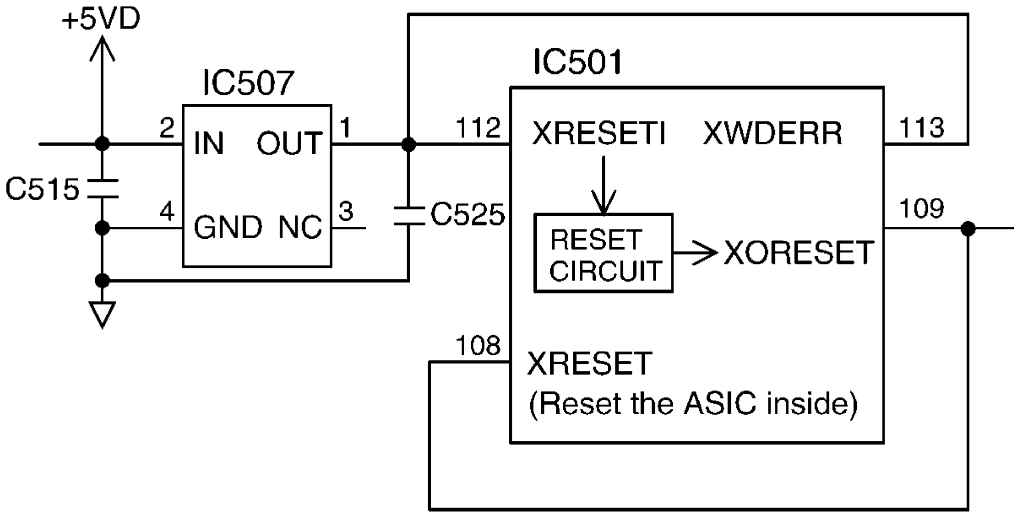
NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
81	VSS		GND	POWER SOURCE (GND)
82	VDD (5V)		5V	POWER SOURCE (5V)
83	ADR0	O	5V	CPU ADDRESS BUS 0
84	ADR1	O	5V	CPU ADDRESS BUS 1
85	ADR2	O	5V	CPU ADDRESS BUS 2
86	ADR3	O	5V	CPU ADDRESS BUS 3
87	ADR4	O	5V	CPU ADDRESS BUS 4
88	ADR5	O	5V	CPU ADDRESS BUS 5
89	ADR6	O	5V	CPU ADDRESS BUS 6
90	ADR7	O	5V	CPU ADDRESS BUS 7
91	ADR8	O	5V	CPU ADDRESS BUS 8
92	ADR9	O	5V	CPU ADDRESS 9
93	ADR10	O	5V	CPU ADDRESS 10
94	ADR11	O	5V	CPU ADDRESS 11
95	ADR12	O	5V	CPU ADDRESS 12
96	VSS		GND	POWER SOURCE (GND)
97	VDD (5V)		5V	POWER SOURCE (+5V)
98	RBA0	O	5V	ROM/RAM BANK ADDRESS 0
99	RBA1	O	5V	ROM/RAM BANK ADDRESS 1
100	RBA2	O	5V	ROM/RAM BANK ADDRESS 2
101	RBA3	O	5V	ROM/RAM BANK ADDRESS 3
102	RBA4	O	5V	ROM/RAM BANK ADDRESS 4
103	RBA5	O	5V	ROM/RAM BANK ADDRESS 5
104	RBA6/IOP96	O	5V	OUTPUT PORT(HSALC)
105	STB1	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
106	STB2	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
107	STB3	O	5V	STROBE SIGNAL OUTPUT TO THER HEAD
108	XRESET	I	5V	RESET INPUT
109	XORESET	O	5V	RESET OUTPUT
110	VDD (5V)		5V	POWER SOURCE (+5V)
111	VSS		GND	POWER SOURCE (GND)
112	XRESETI	I	5V	RESET INPUT
113	WDERR	O	5V	WATCHED ERROR OUTPUT SIGNAL
114	THDAT	O	5V	RECORDED IMAGE OUTPUT
115	THCLK	O	5V	CLOCK OUTPUT FOR DATA TRANS
116	VDD (3.3V)		3.3V	POWER SOURCE (3.3V)
117	VSS		GND	POWER SOURCE (GND)
118	THLAT	O	5V	PULSE OUTPUT FOR DATA LATCH
119	STBNP	I	5V	INPUT PORT (TEST)
120	RM0/IOP	O	5V	OUTPUT PORT (SIDE TONE/A)

NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	DESCRIPTION
121	RM1/IOP	O	5V	OUTPUT PORT
122	RM2/IOP	O	5V	OUTPUT PORT
123	RM3/IOP	O	5V	OUTPUT PORT (B)
124	RXE/IOP	I	5V	INPUT PORT (NOT USED) PULL DOW
125	TMO	O	5V	MOTOR A PHASE
126	VDD (5V)		5V	POWER SOURCE (+5V)
127	VSS		GND	POWER SOURCE (GND)
128	TM1/IOP	O	5V	MOTOR B PHASE
129	TM2/IOP	O	5V	MOTOR /A PHASE
130	TM3/IOP	O	5V	MOTOR /B PHASE
131	TXE/IOP	O	5V	MOTOR ENABLE SIGNAL
132	KSTART	O	5V	OPERATION PANEL CONTROL
133	KLATCH	O	5V	OPERATION PANEL CONTROL
134	KSCLK	O	5V	OPERATION PANEL CONTROL
135	KTXD	O	5V	OPERATION PANEL CONTROL
136	KRXD	I	5V	OPERATION PANEL CONTROL
137	ADSEL1	O	5V	CHANNEL SELECT SIGNAL FOR AIN
138	VSSC		GND	POWER SOURCE (ANALOGUE GND)
139	VDDC		3.3V	POWER SOURCE (ANALOGUE +3.3V
140	VSSA		GND	POWER SOURCE (ANALOGUE GND)
141	VDDA		3.3V	POWER SOURCE (ANALOGUE +3.3V
142	VREFB	A	3.3V	A/D CONVERTER’S ZERO STANDAR VOLTAGE OUTPUT
143	VCL	A	3.3V	ANALOGUE PART STANDARD VOLTAGE SIGNAL
144	VREFT	A	3.3V	A/D CONVERTER’S FULL SCALE VOLTAGE OUTPUT

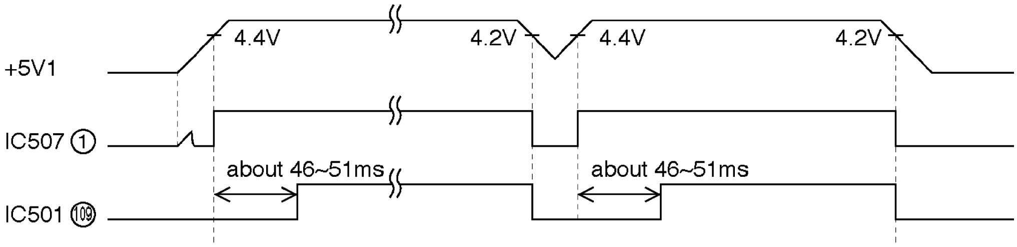
6.3.7. RESET CIRCUIT (WATCH DOG TIMER)

The output signal from pin 1 of the voltage detect IC (IC507) is input to the ASIC (IC501) 112 pin. Then the output signal from pin 109 of the ASIC (IC501) resets the ASIC.

Circuit Diagram


+5VD
IC507
IN
OUT
GND
NC
2
1
4
3
C515
C525
IC501
112
XRESETI
XWDERR
113
RESET CIRCUIT
XORESET
109
108
XRESET
(Reset the ASIC inside)

1. During a momentary power interruption, a positive reset pulse of 46~51 msec is generated and the system is reset completely.



2. When pin 108 and 109 of IC501 become low level, they will prohibit the SRAM (IC504) from changing data.
   The SRAM (IC504) will go into the backup mode, when they are backed up by a lithium battery.
3. The watch dog timer, built-in the ASIC (IC501), is initialized by the CPU about every 1.5 ms.
   When a watch dog error occurs, pin 113 of the ASIC (IC501) becomes low level.
   The terminal of the 'WDERR' signal is connected to the reset line, so the 'WDERR' signal works as the reset signal.

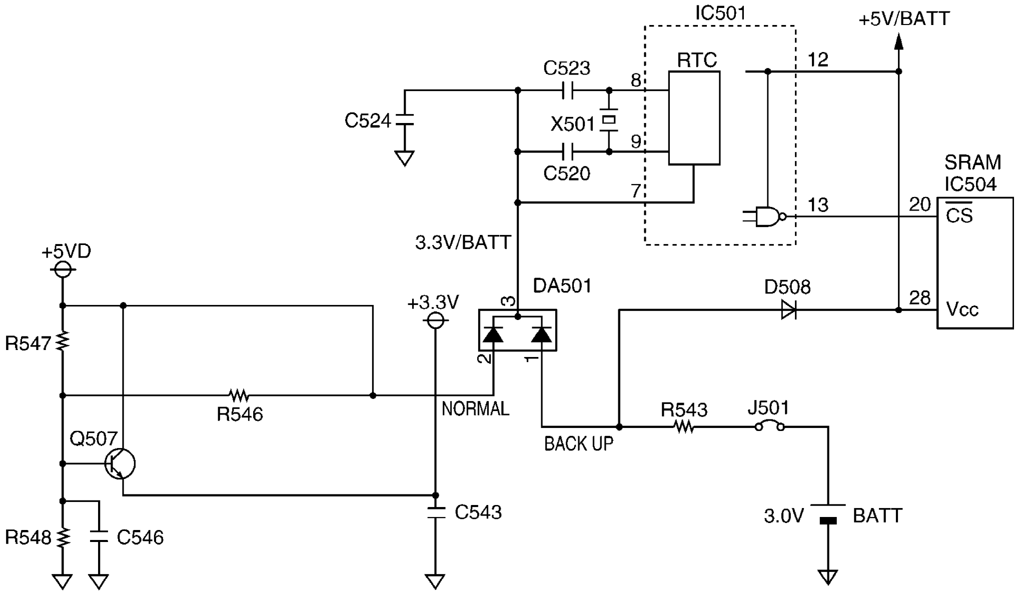
6.3.8. SRAM AND RTC BACKUP CIRCUIT

1. Function
   This unit has a lithium battery (BAT501) which works for the SRAM (IC504) and Real Time Clock IC (RTC: inside IC501).
   The user parameters for autodial numbers, the system setup data

and others are stored in the SRAM (IC504).
The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.

2. **SRAM (IC504) Backup Circuit Operation**
   When the power switch is turned ON, power is supplied through pin 12 of IC501 to the SRAM (IC504). At this time, the voltage at pin 28 of the SRAM is 5V. When the power switch is turned OFF, the BAT501 supplies power to the SRAM through J501, R543 and D508. The voltage at pin 28 of the SRAM is about +2.5V. When the power switch is OFF and the voltage of +5V decreases, the voltage detect IC (IC507) outputs "Low" level and the IC501 outputs the reset signal. Pin 28 of the SRAM becomes roughly the same voltage as the battery voltage. At this point, pin 20 (CS) of IC504 becomes high level, causing the SRAM to go into the backup mode, in which the power consumption is lower.
3. **RTC Inside (IC501) Backup Circuit Operation**
   When the power switch is turned ON, power is supplied through DA501 to the RTC (inside IC501). At this time, the voltage at pin 7 of the IC501 is +3.3V. When the power switch is turned OFF, the BAT501 supplies power to RTC through DA501. The voltage at pin 7 of IC501 is about +2.5V. When the power switch is OFF and the voltage of +3.3V decreases, pin 7 of RTC (IC501) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram


IC501
+5V/BATT
C523
RTC
12
8
C524
X501
9
C520
7
SRAM
IC504
13
20
CS
3.3V/BATT
+5VD
DA501
D508
+3.3V
3
28
Vcc
R547
2
1
R546
NORMAL
R543
J501
Q507
BACK UP
C543
3.0V
BATT
R548
C546

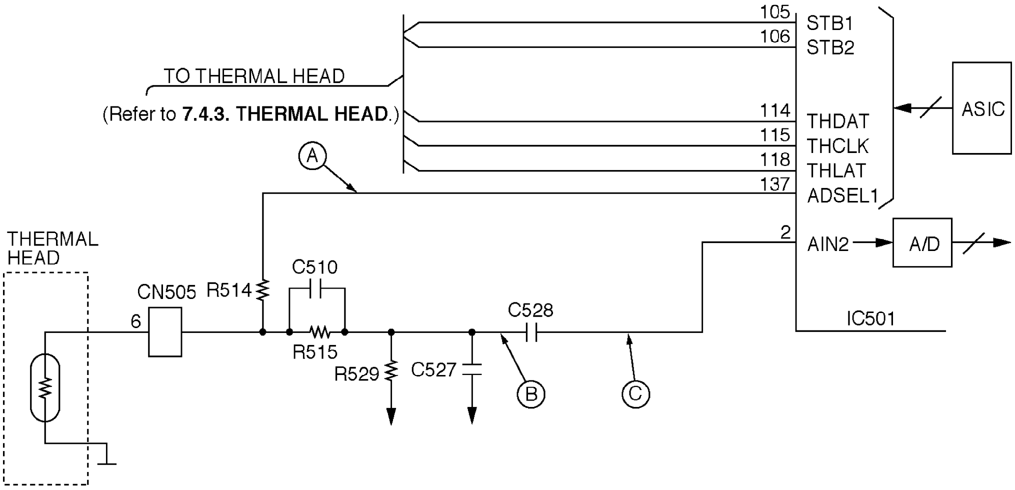
6.3.9. SUPERVISION CIRCUIT FOR THE THERMAL HEAD TEMPERATURE

1. Function

The thermistor changes the resistor according to the temperature and uses the thermistor's characteristics. The output of pin 137 of IC501 becomes a low level. Then when it becomes a high level, it triggers point A In point C, according to the voltage output time, the thermal head's temperature is detected.

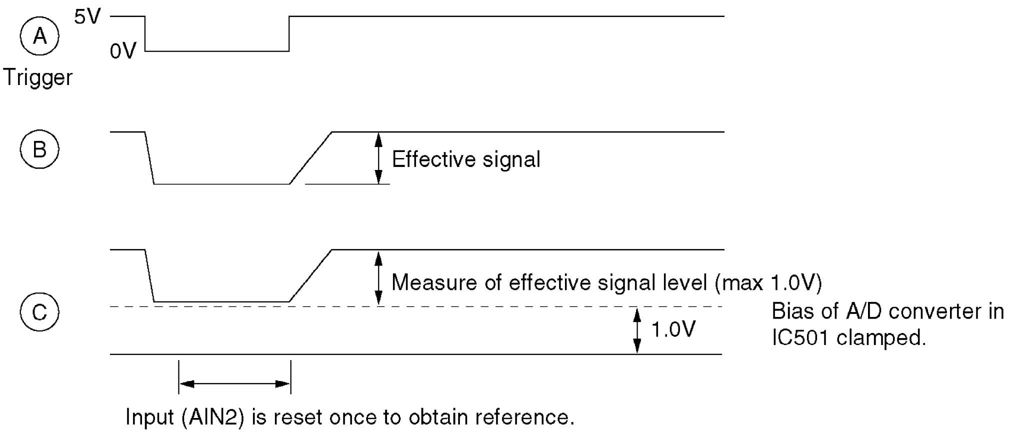
After the thermal head temperature is converted to voltage in B, it is then changed to digital data in the A/D converter inside IC501. The CPU decides the strobe width of the thermal head according to this value. Therefore, this circuit can keep the thermal head at an even temperature in order to stabilize the printing density and prevent the head from being overheated.

Circuit Diagram



TO THERMAL HEAD
(Refer to 7.4.3. THERMAL HEAD.)
105
106
STB1
STB2
114
115
118
137
THDAT
THCLK
THLAT
ADSEL1
ASIC
A
THERMAL HEAD
CN505
6
R514
C510
R515
R529
C527
C528
B
C
2
AIN2
A/D
IC501

Timing Chart



CROSS REFERENCE:

THERMAL HEAD()

6.4. FACSIMILE SECTION

6.4.1. IMAGE DATA FLOW DURING FACSIMILE OPERATION

Copy (Fine, Super-Fine, Half Tone)

1. Line information is read by CIS (to be used as the reference white level) via route1, and is input to IC501. Refer to BLOCK DIAGRAM()
2. In IC501, the data is adjusted to a suitable level for A/D conversion in the Analogue Signal Processing Section, and via route2 it is input to A/D conversion (8 bit). After finishing A/D conversion, the data is input to the Image Processing Section via route3. Then via route4 and route5, it is stored in RAM as shading

data.

3. The draft’s information that is read by CIS is input to IC501 via route1. After it is adjusted to a suitable level for A/D conversion via route2, the draft’s information is converted to A/D (8 bit), and it is input to the Image Processing Section. The other side, the shading data which flows from RAM via route6 and route7, is input to the Image Processing Section. After finishing the draft’s information image processing, white is regarded as "0" and black is regarded as "1". Then via routes4 and 5, they are stored in RAM.
4. The white/black data stored as above via routes6 and8 is input to the P/S converter. The white/black data converted to serial data in the P/S converter is input to the Thermal Head via route9 and is printed out on recording paper.

Note:
Standard : Reads 3.85 times/mm
Fine : Reads 7.7 times/mm
Super-Fine : Reads 15.4 times/mm

Transmission

1. Same processing as Copy items 1 - 3.
2. The data stored in the RAM of IC501 is output from IC501 via routes6 and 10, and is stored in the system bus.
   Via route11, it is stored in the communication buffer inside DRAM (IC503).
3. While retrieving data stored in the communication buffer synchronous with the modem, the CPU (inside IC501) inputs the data to the modem along route12, where it is converted to serial analogue data and forwarded over the telephone lines via the NCU Section.

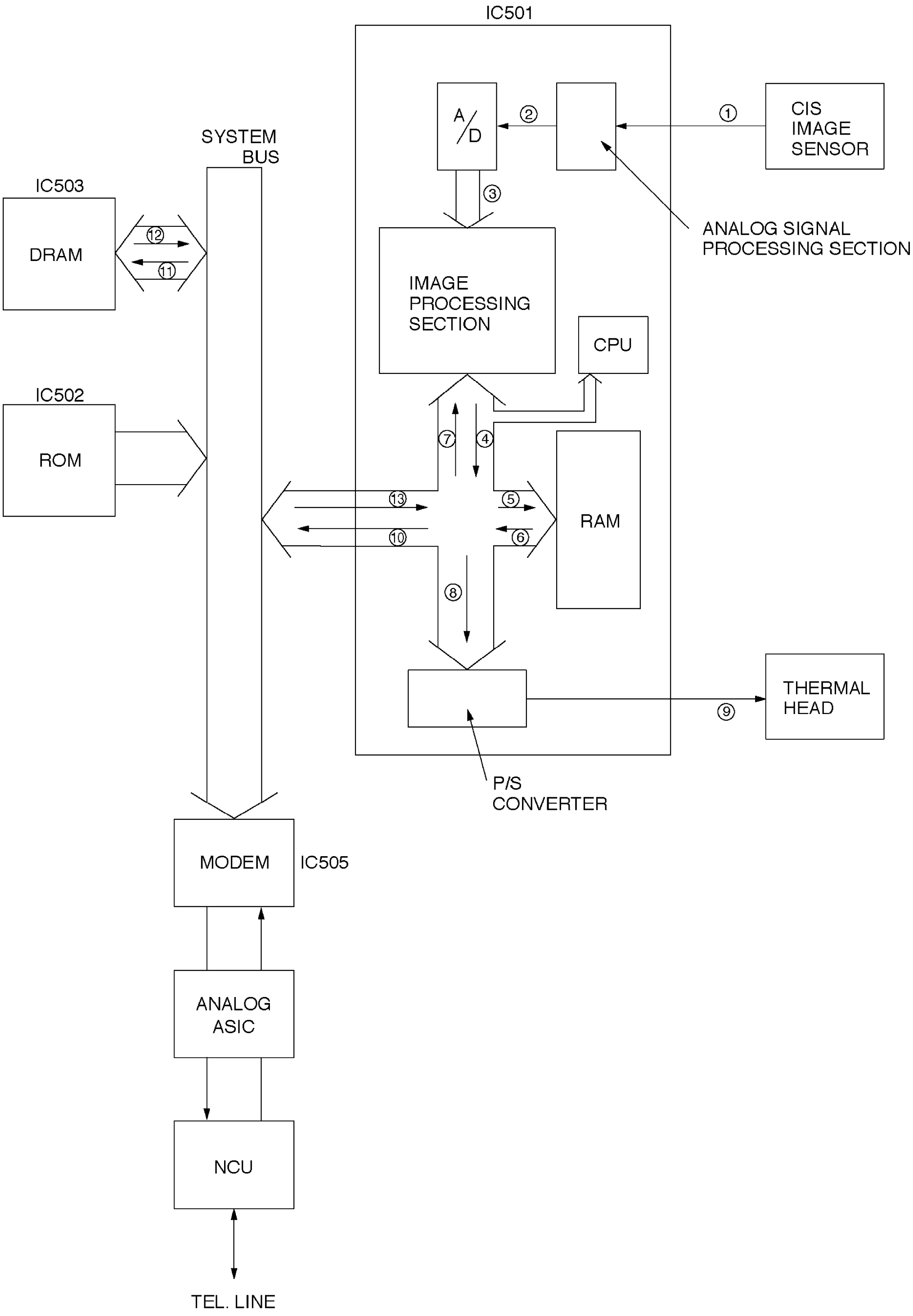
Reception

1. The serial analogue image data is received over the telephone lines and input to the modem via the NCU section, where it is

demodulated to parallel digital data. Then the CPU (IC501) stores the data in the communication buffer DRAM (IC503) along route12.

2. The data stored in DRAM (IC503) is decoded by the CPU (IC501) via route12, and is stored in DRAM (IC503) via routes13 and 5.
3. Same processing as Copy item 4.

6.4.2. BLOCK DIAGRAM


IC501
A/D
②
①
CIS IMAGE SENSOR
SYSTEM BUS
IC503
DRAM
⑫
⑪
③
ANALOG SIGNAL PROCESSING SECTION
IMAGE PROCESSING SECTION
CPU
IC502
ROM
⑦
④
⑬
⑤
RAM
⑩
⑥
⑧
THERMAL HEAD
⑨
P/S CONVERTER
MODEM
IC505
ANALOG ASIC
NCU
TEL. LINE

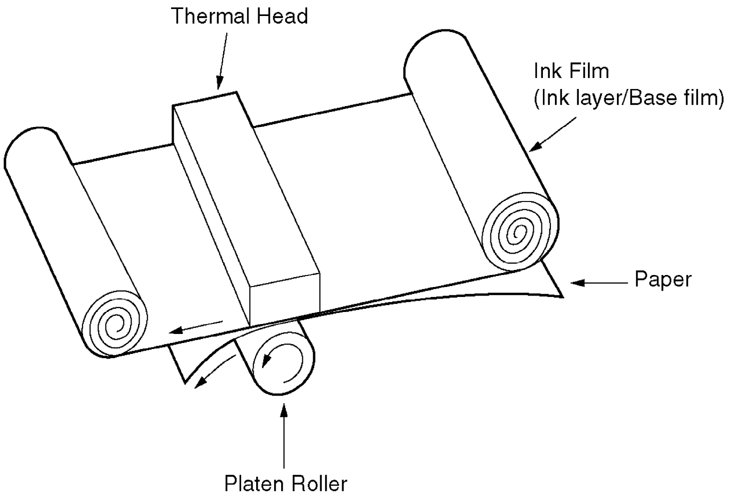
6.4.3. THERMAL HEAD

1. Function

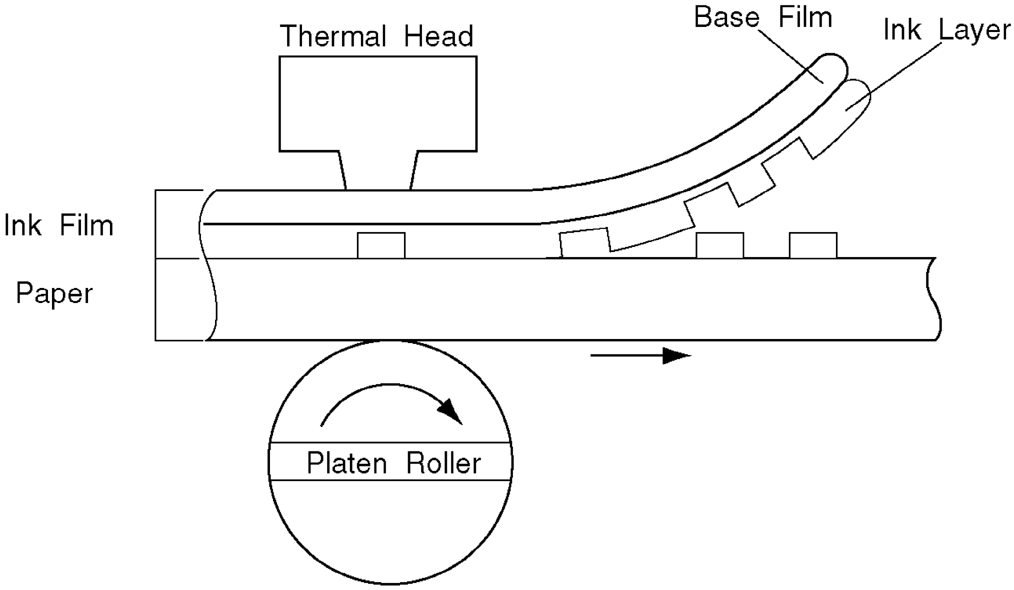
This unit utilizes the state of the art thermal printer technology. The ink film is chemically processed. The ink film is comprised of two parts: an ink layer and a base film. When the thermalhead contacts this ink film, it emits heat momentarily, and the ink layer

is melted and transferred to the paper. If this continues, letters and /or diagrams appear, and the original document is reproduced.

COMPOSITION OF THE RECEIVE RECORD SECTION (THERMAL RECORDING FORMAT)


Thermal Head
Ink Film
(Ink layer/Base film)
Paper
Platen Roller

Thermal Transfer


Thermal Head
Base Film
Ink Layer
Ink Film
Paper
Platen Roller

2. Circuit Operation

Refer to the block diagram and the timing chart on the following page.

There are 9 driver ICs aligned horizontally on the thermal head and each one of these ICs can drive 192 heat-emitting registers. This means that one line is at a density of 192×9=1728 dots=(8 dots/mm).

White/Black (white=0, black=1) data in one line increment is

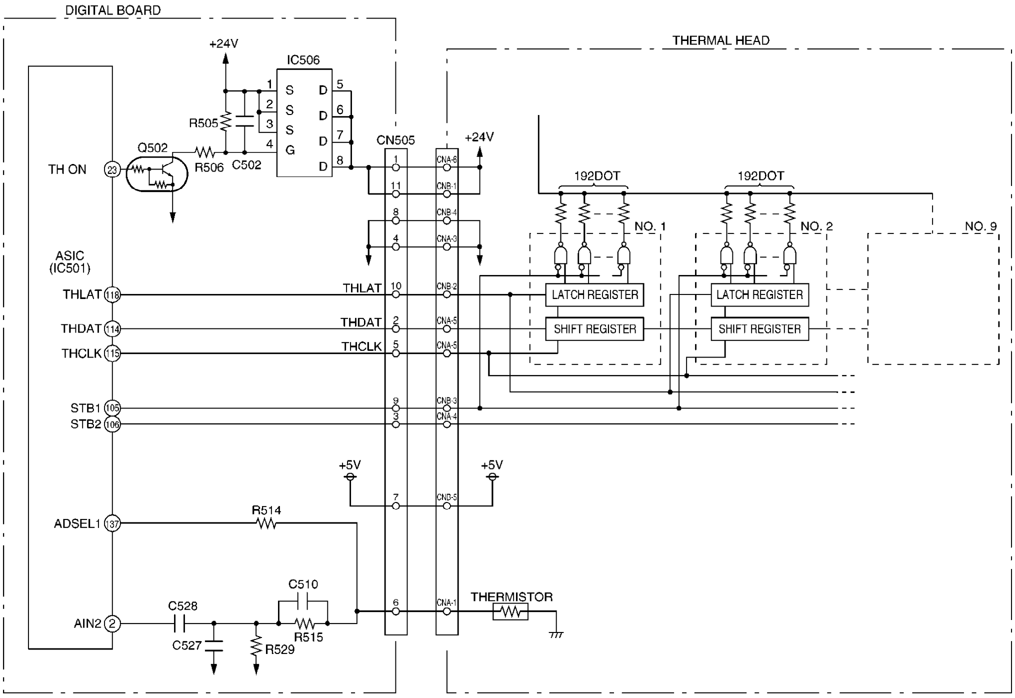
synchronized at IC501 pin 115 (THCLK), and sent from IC501 pin 114 (THDAT) to the shift register of the ICs. The shift registers of the 9 ICs are connected in series, and upon the shift of the 1728 dot increment, the shift register becomes filled with data, and a latch pulse is emitted to each IC from IC501 pin 118 (THLAT). With this latch pulse, all the contents of the shift registers are latched to the latch registers. Thereafter, through the addition of strobes from the IC501 pins (104, 105), only the dot location of black (=1) among latched data activates the driver, and the current passes to heat the emitting body to cause heat emission.

Here, the two line strobes, STB1 to STB3, impress at intervals of 9.216 msec, as required for one-line printout.

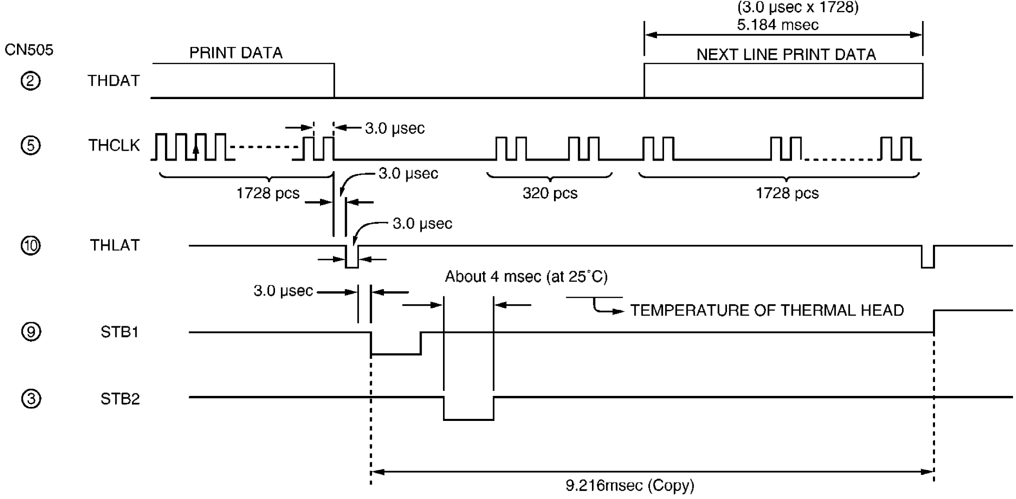
The sequence is shown on the next page. [Moreover, for the strobe width, the thermistor value inside the thermal head is detected according to IC501 pin 2. Depending on that value, the strobe width is recorded in ROM (IC502). Accordingly, the strobe width is determined.]

When the thermal head is not used, the IC501 (23, THON) becomes low , Q502 turns OFF, IC506 turns OFF, and the +24V power supply for the thermal head driver is not impressed to protect the IC.

Circuit Diagram


DIGITAL BOARD
+24V
IC506
1
2
3
4
S
S
S
G
D
D
D
D
5
6
7
8
R505
Q502
R506
C502
TH ON
23
ASIC
(IC501)
THLAT
118
THDAT
114
THCLK
115
STB1
105
STB2
106
ADSEL1
137
AIN2
2
R514
C510
C528
C527
R529
R515
CN505
1
11
8
4
10
2
5
9
3
7
6
CNA-6
CNB-1
CNB-4
CNA-3
CNB-2
CNA-5
CNA-5
CNB-3
CNA-4
CNB-5
CNA-1
+24V
+5V
+5V
THERMISTOR
THERMAL HEAD
192DOT
192DOT
NO. 1
NO. 2
NO. 9
LATCH REGISTER
SHIFT REGISTER
LATCH REGISTER
SHIFT REGISTER

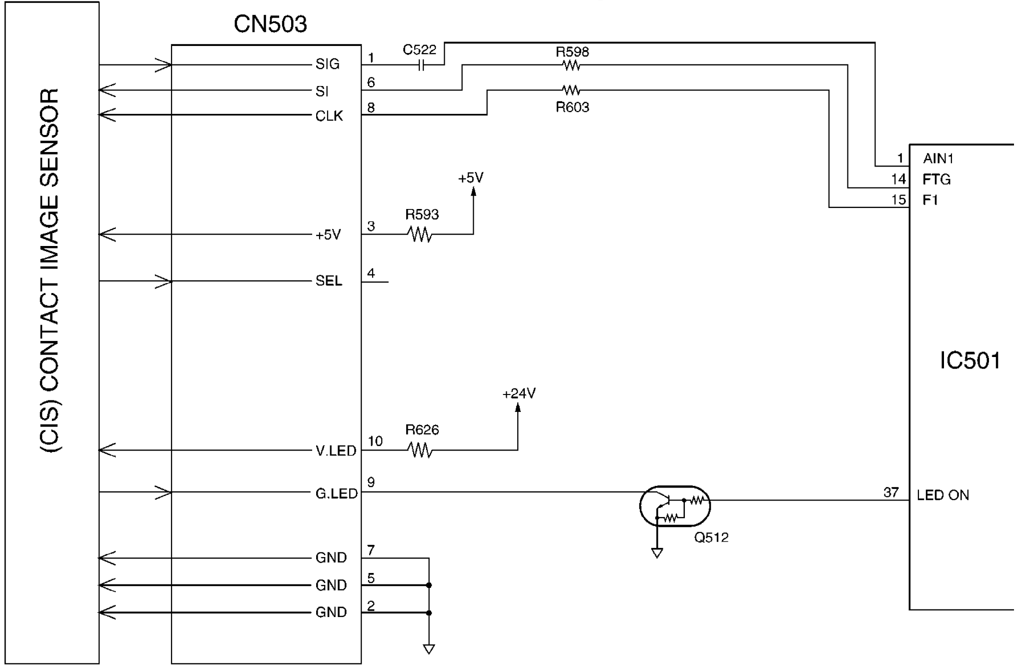
Timing Chart


(3.0 µsec x 1728)
5.184 msec
CN505
PRINT DATA
NEXT LINE PRINT DATA
② THDAT
⑤ THCLK
3.0 µsec
3.0 µsec
1728 pcs
320 pcs
1728 pcs
⑩ THLAT
3.0 µsec
3.0 µsec
About 4 msec (at 25˚C)
TEMPERATURE OF THERMAL HEAD
⑨ STB1
③ STB2
9.216msec (Copy)

6.4.4. SCANNING BLOCK

The scanning block of this device consists of a control circuit and a contact image sensor made up of a celfoc lens array, an LED array, and photoelectric conversion elements.

Circuit Diagram


(CIS) CONTACT IMAGE SENSOR
CN503
SIG
SI
CLK
+5V
SEL
V.LED
G.LED
GND
GND
GND
1
6
8
3
4
10
9
7
5
2
C522
R598
R603
+5V
R593
+24V
R626
Q512
IC501
1 AIN1
14 FTG
15 F1
37 LED ON

When an original document is inserted and the start button pressed, pin 37 of IC501 goes to a high level and the transistor Q512 turns on.This applies voltage to the LED array to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC501, and the original image illuminated by the LED array undergoes photoelectric conversion to output an analogue image signal (SIG). The analog image signal is input to the system ASIC on AIN1 (pin 1 of IC501) and converted into 8-bit data by the A/D converter inside IC501. Then this signal undergoes digital processing in order to obtain a high-quality image.

6.4.5. STEPPING MOTOR DRIVE CIRCUIT

1. Function

The stepping motor works for both transmission and reception.

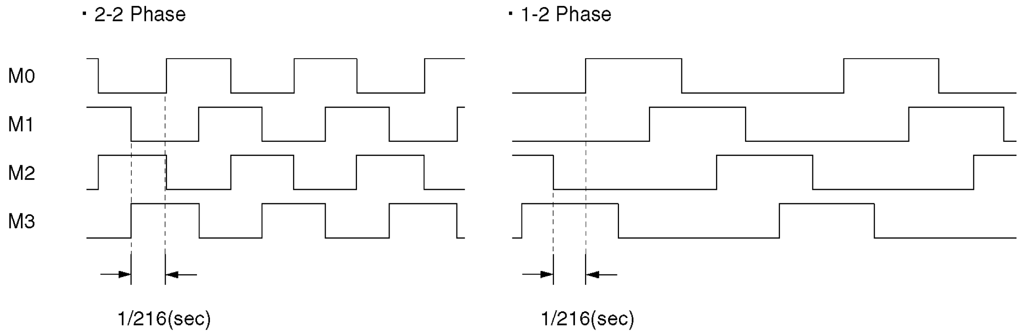
2. Motor

During motor driving, pin 131 of ASIC IC501 becomes a high level, and Q503, Q501 turns ON. As a result, +24V is supplied to the motor coil.

Stepping pulses are output from ASIC IC501 pins, 125, 128~130, causing driver IC508 pins, 15~12 to drive the Motor Coil. The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation. A 1-step rotation feeds 0.13 mm of recording paper or document paper.

The timing chart is below.

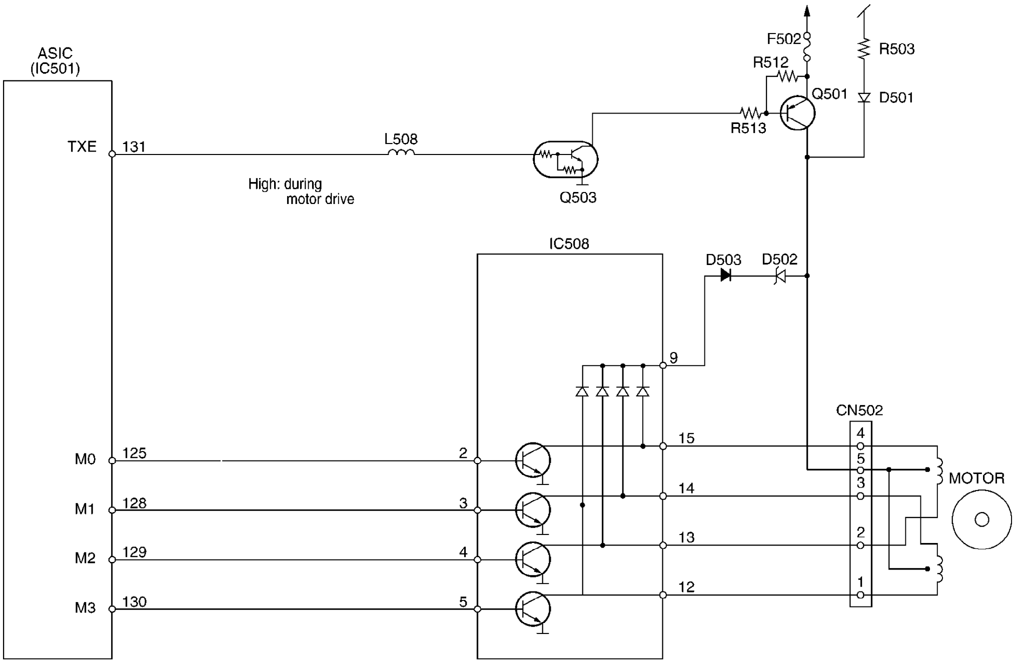
Stepping Monitor Timing Chart



Stepping Motor Drive Mode

Function	Mode	Phase Pattern	Speed
Copy	Fine	1-2	216 pps
FAX	Standard	2-2	216 pps
	Fine or Half tone	1-2	216 pps
Paper Feed	———	2-2	216 pps
Stand-by	———	All phases are currently off.	None

Circuit Diagram


+24V
+5VD
F502
R503
R512
ASIC
(IC501)
Q501
D501
R513
TXE
131
L508
High: during
motor drive
Q503
IC508
D503
D502
9
CN502
4
5
3
2
1
MOTOR
M0
125
2
15
M1
128
3
14
M2
129
4
13
M3
130
5
12

The motor suspends while it is in the receive mode (about 70~80 msec), pin 131 of ASIC IC501 becomes a low level and Q503 turns OFF. Then Q501 also turns OFF, and instead of +24 V, +5 V is supplied through D501 so that the motor is held in place. When the system is in the stand-by mode, all of the motor drive transistors turn OFF. Consequently, the motor current stops.

6.4.6. GEAR SECTION

This model provides a motor-driven gear mechanism for transmitting/copying documents and printing fax data. In this chapter, you will see how the gears work to select and operate a mode and how the gear section, sensors and rollers mechanically work during the main operations (FAX transmission, FAX reception and Copy).

6.4.6.1. MODE SELECTION (See Fig. 1)

When a motor with Drive Motor Gear attached rotates counterclockwise (CCW), Swing Gear C engages CAM Gear to rotate counterclockwise (CCW). This operation provide four mode options (A: Transmit mode, B: Paper-Pickup mode, C: Receive mode and D: Copy mode) selected by the Sensor Switch. (The Sensor Switch Lever’s position in the CAM Gear controlled by the software selects a specific mode.) You can see which mode is selected by confirming the Mode Marker’s position as shown in
Fig. 1-a~1-d.
(Ex. If the Mode Marker is in position A, a transmit mode is selected.)

Note:
The arrows show the directions in which the active gears turn around.

Fig. 1: Mode Selection

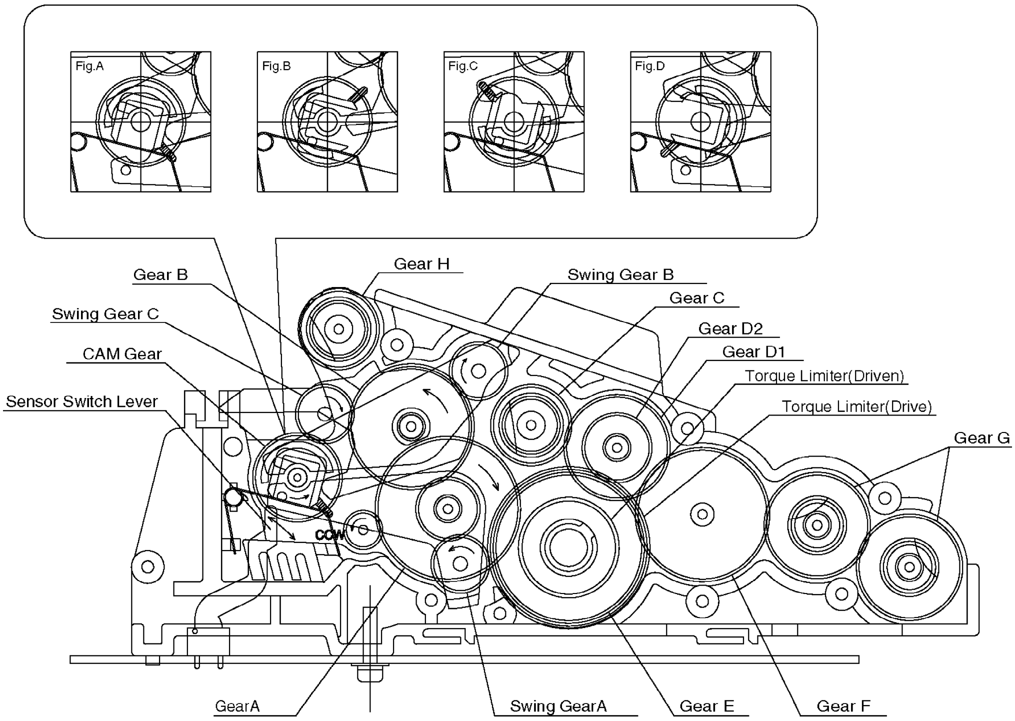


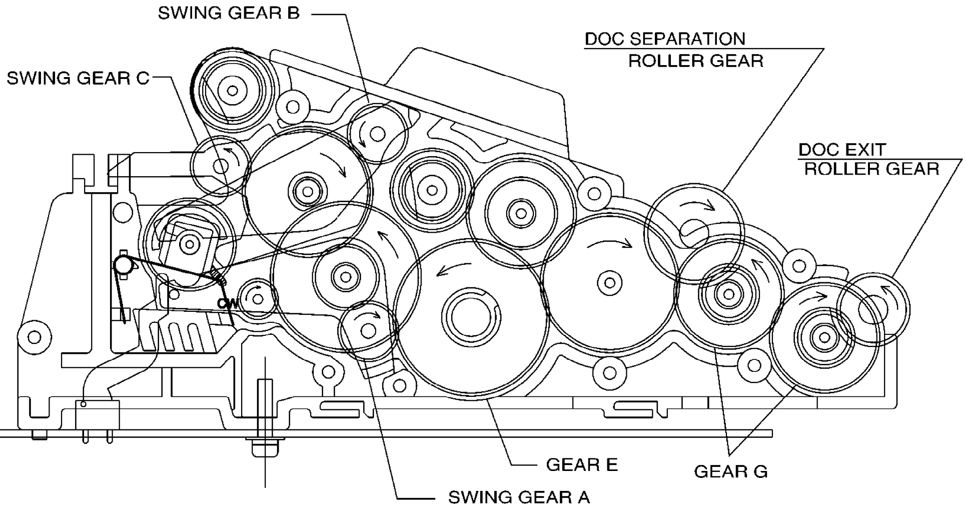
Fig.A
Fig.B
Fig.C
Fig.D
Gear B
Gear H
Swing Gear B
Gear C
Gear D2
Gear D1
Torque Limiter(Driven)
Torque Limiter(Drive)
Swing Gear C
CAM Gear
Sensor Switch Lever
Gear G
CCW
GearA
Swing GearA
Gear E
Gear F

6.4.6.2. MODE OPERATION

Once a mode is selected, the Drive Motor Gear rotates clockwise (CW) and then the controlling positions of Swing Gears A, B and C determine which gears convey their drive power in each mode.

A. Transmit mode (See Fig. A.) :
Swing Gear A engages Gear E and conveys its power to the Separation Roller Gear through Gear G and sets the Separation Roller for feeding documents.

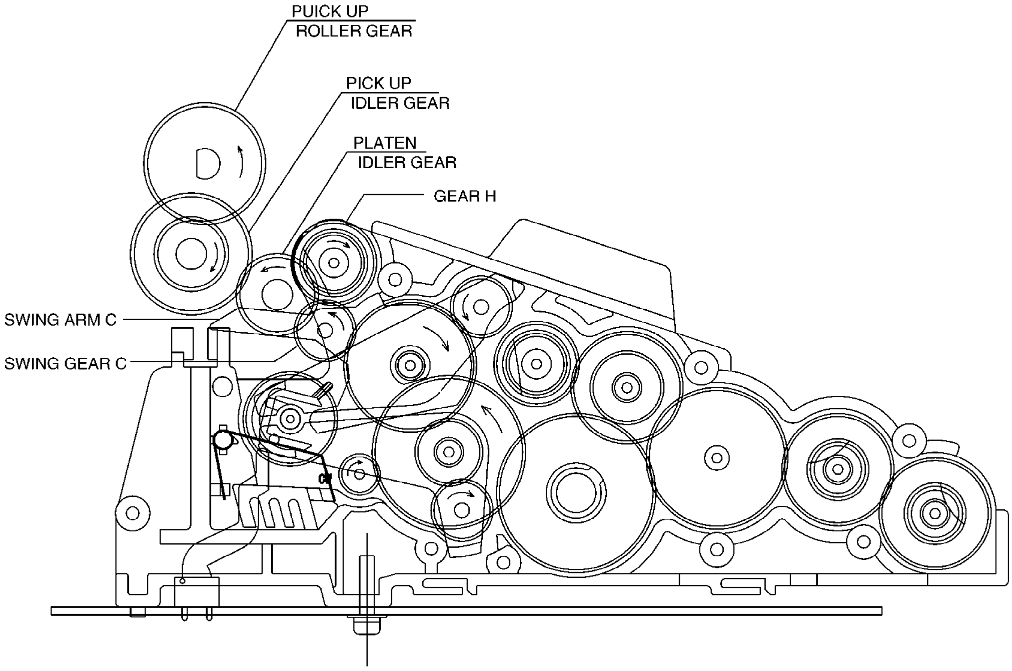
Fig. A: Transmit mode


SWING GEAR B
DOC SEPARATION ROLLER GEAR
SWING GEAR C
DOC EXIT ROLLER GEAR
CW
GEAR E
GEAR G
SWING GEAR A

B. Paper-Pickup mode (See Fig. B) :

Swing Gear C engages Gear H and provides its power to the Pick up Roller Gear and Platen Idler Gear and Pick up Idler Gear. The Gear drive as follows: Swing Arm C → engaging → Gear H → Platen Idler Gear → Pick up Idler Gear → Pickup roller Gear. The Pickup Roller picks up and pre-feeds a recording paper until the recording paper pushes up the Paper Top sensor* lever.

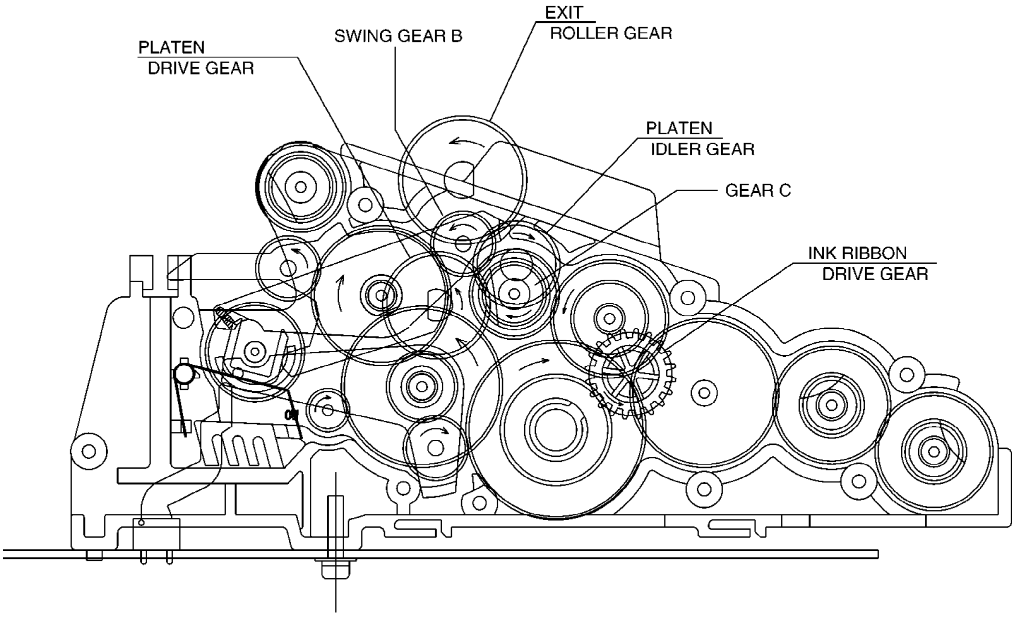
Fig. B: Paper-Pickup mode


PUICK UP
ROLLER GEAR
PICK UP
IDLER GEAR
PLATEN
IDLER GEAR
GEAR H
SWING ARM C
SWING GEAR C

Note* :
See "Sensor Location" in SENSORS AND SWITCHES().

C. Receive mode (See Fig. C.) :
After paper pick up mode, Swing Gear B engages Gear C and conveys its power to the Platen Roller Gear and Ink Ribbon Drive Gear through Platen Drive Gear. Then, the Platen Roller feeds recording paper for printing the received data.

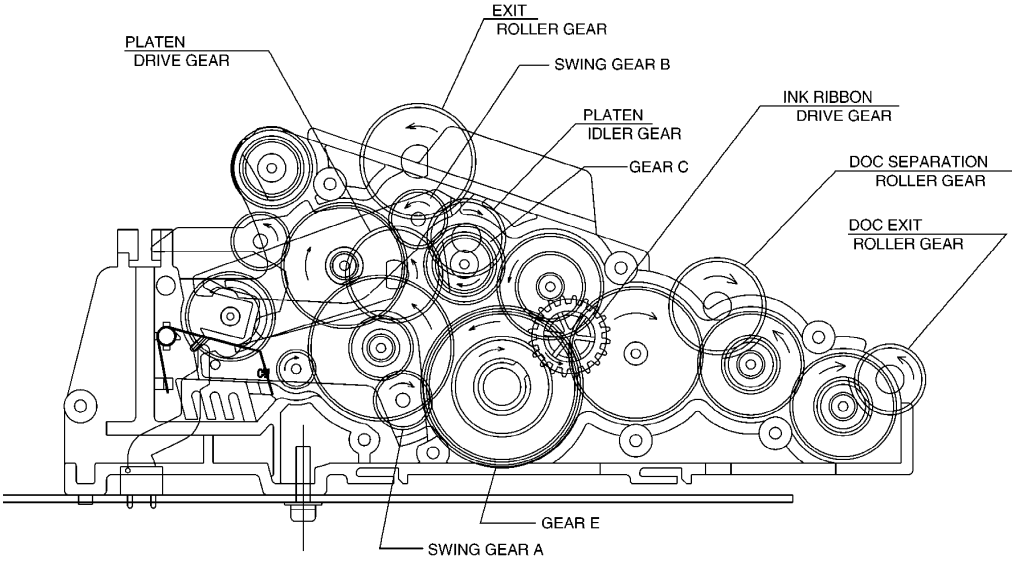
Fig. C: Receive mode


EXIT
ROLLER GEAR
PLATEN
DRIVE GEAR
SWING GEAR B
PLATEN
IDLER GEAR
GEAR C
INK RIBBON
DRIVE GEAR

D. Copy mode (See Fig. D.) :

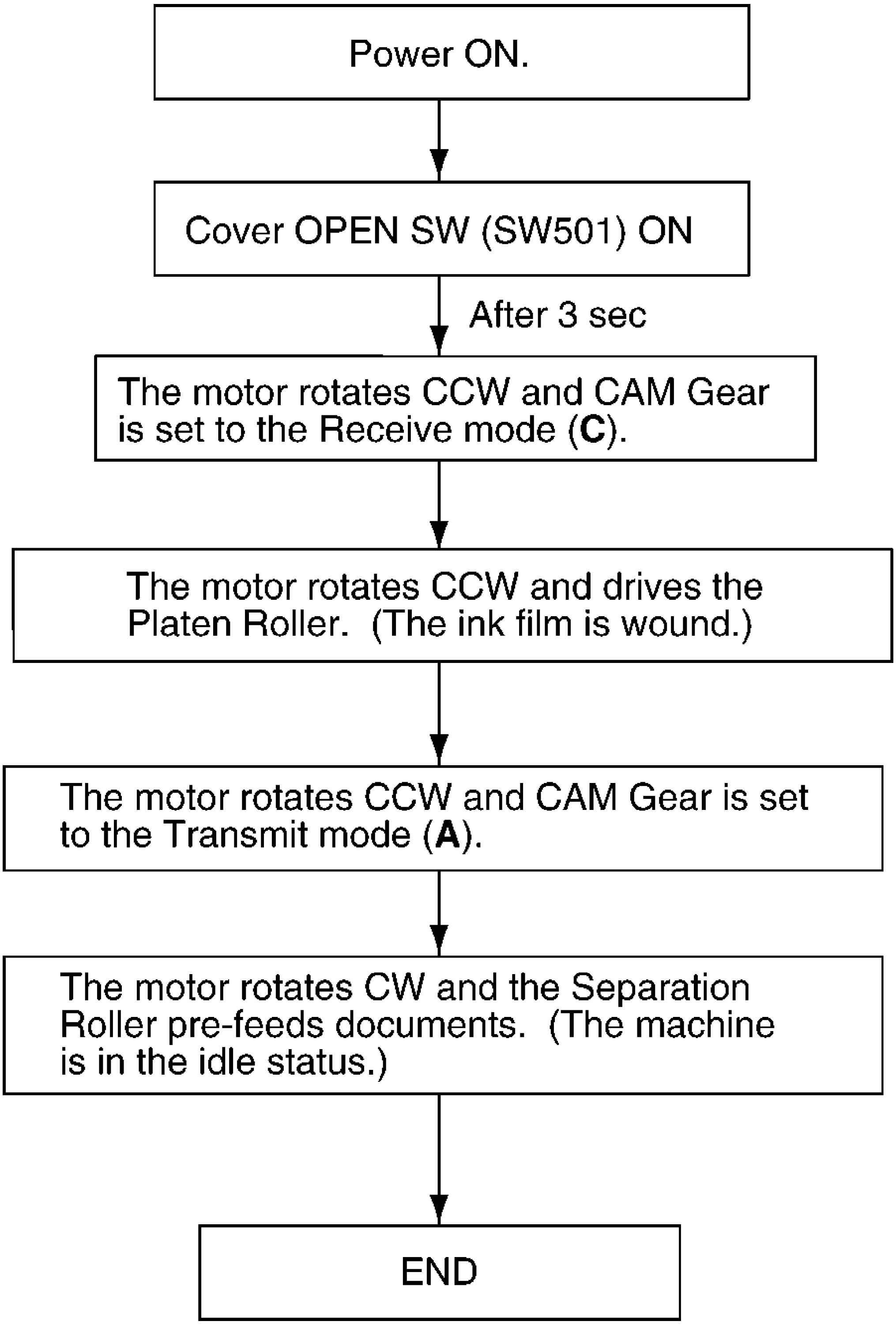
Documents pre-feeding → Transmit mode go → Recording paper feeding → Pick up mode go. Next Swing Gear A and B engages Gear E and Gear C respectively and conveys the power to the Separation Roller Gear and the Platen Roller Gear. Then the Separation Roller feeds documents and the Platen Roller feeds recording paper for printing copier data.

Fig. D: Copy mode


EXIT
ROLLER GEAR
PLATEN
DRIVE GEAR
SWING GEAR B
INK RIBBON
DRIVE GEAR
PLATEN
IDLER GEAR
GEAR C
DOC SEPARATION
ROLLER GEAR
DOC EXIT
ROLLER GEAR
GEAR E
SWING GEAR A

6.4.6.3. MECHANICAL MOVEMENTS IN THE MAIN OPERATIONS (transmitting documents, receiving faxes and copying)

6.4.6.3.1. IDLE STATUS

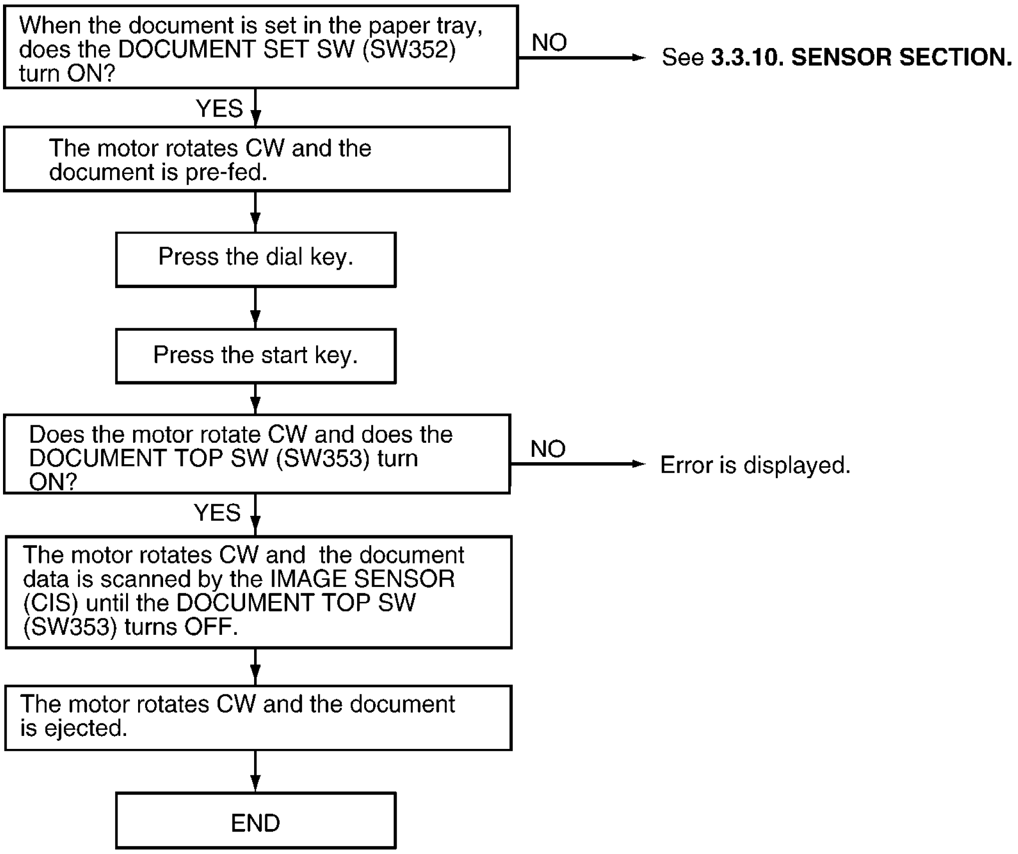


Power ON.
Cover OPEN SW (SW501) ON
After 3 sec
The motor rotates CCW and CAM Gear is set to the Receive mode (**C**).
The motor rotates CCW and drives the Platen Roller. (The ink film is wound.)
The motor rotates CCW and CAM Gear is set to the Transmit mode (**A**).
The motor rotates CW and the Separation Roller pre-feeds documents. (The machine is in the idle status.)
END

Note:

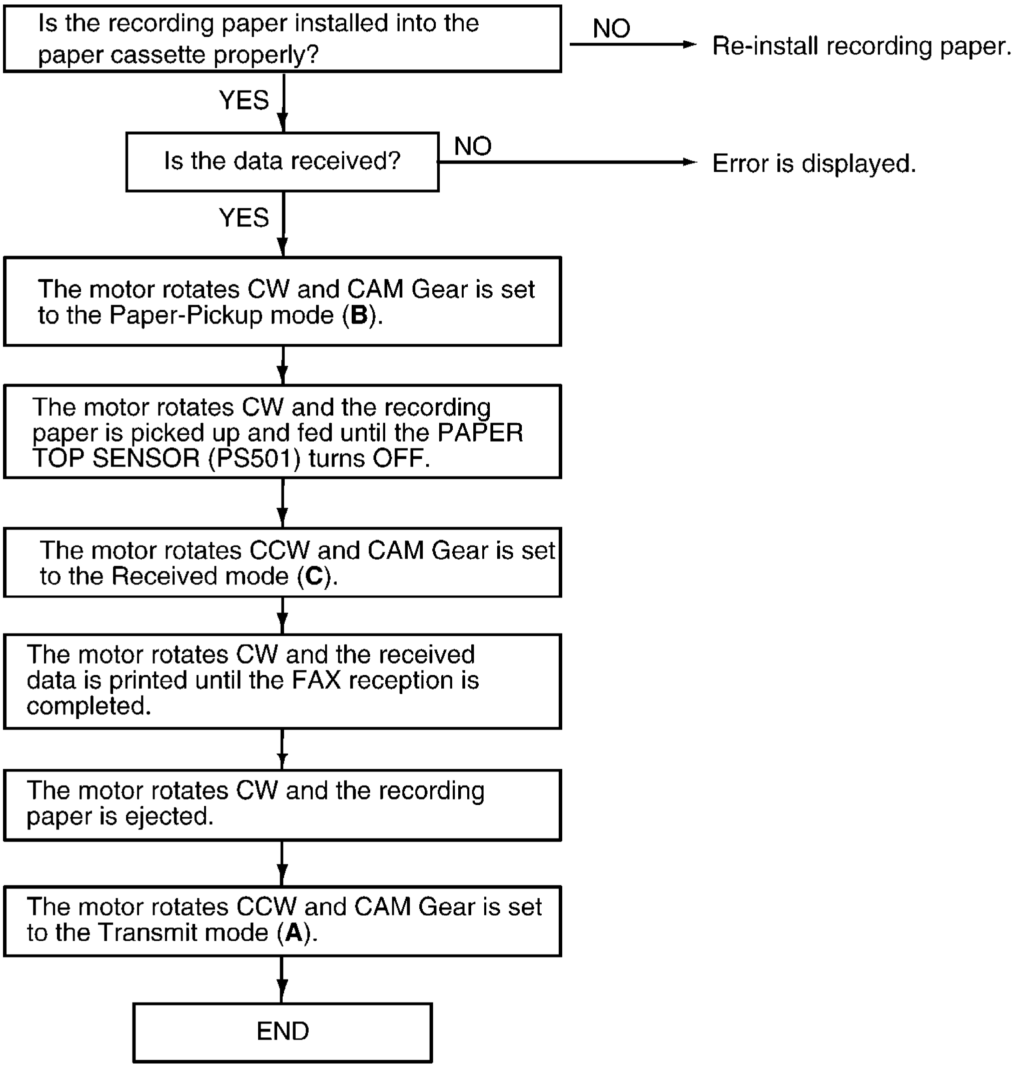
See “Sensor Locations” in SENSORS AND SWITCHES().

6.4.6.3.2. TRANSMITTING DOCUMENTS


When the document is set in the paper tray, does the DOCUMENT SET SW (SW352) turn ON?
NO
See 3.3.10. SENSOR SECTION.
YES
The motor rotates CW and the document is pre-fed.
Press the dial key.
Press the start key.
Does the motor rotate CW and does the DOCUMENT TOP SW (SW353) turn ON?
NO
Error is displayed.
YES
The motor rotates CW and the document data is scanned by the IMAGE SENSOR (CIS) until the DOCUMENT TOP SW (SW353) turns OFF.
The motor rotates CW and the document is ejected.
END

CROSS REFERENCE:
SENSOR SECTION().

6.4.6.3.3. RECEIVING FAX


Is the recording paper installed into the paper cassette properly?

Re-install recording paper.

Is the data received?

Error is displayed.

The motor rotates CW and CAM Gear is set to the Paper-Pickup mode (**B**).

The motor rotates CW and the recording paper is picked up and fed until the PAPER TOP SENSOR (PS501) turns OFF.

The motor rotates CCW and CAM Gear is set to the Received mode (**C**).

The motor rotates CW and the received data is printed until the FAX reception is completed.

The motor rotates CW and the recording paper is ejected.

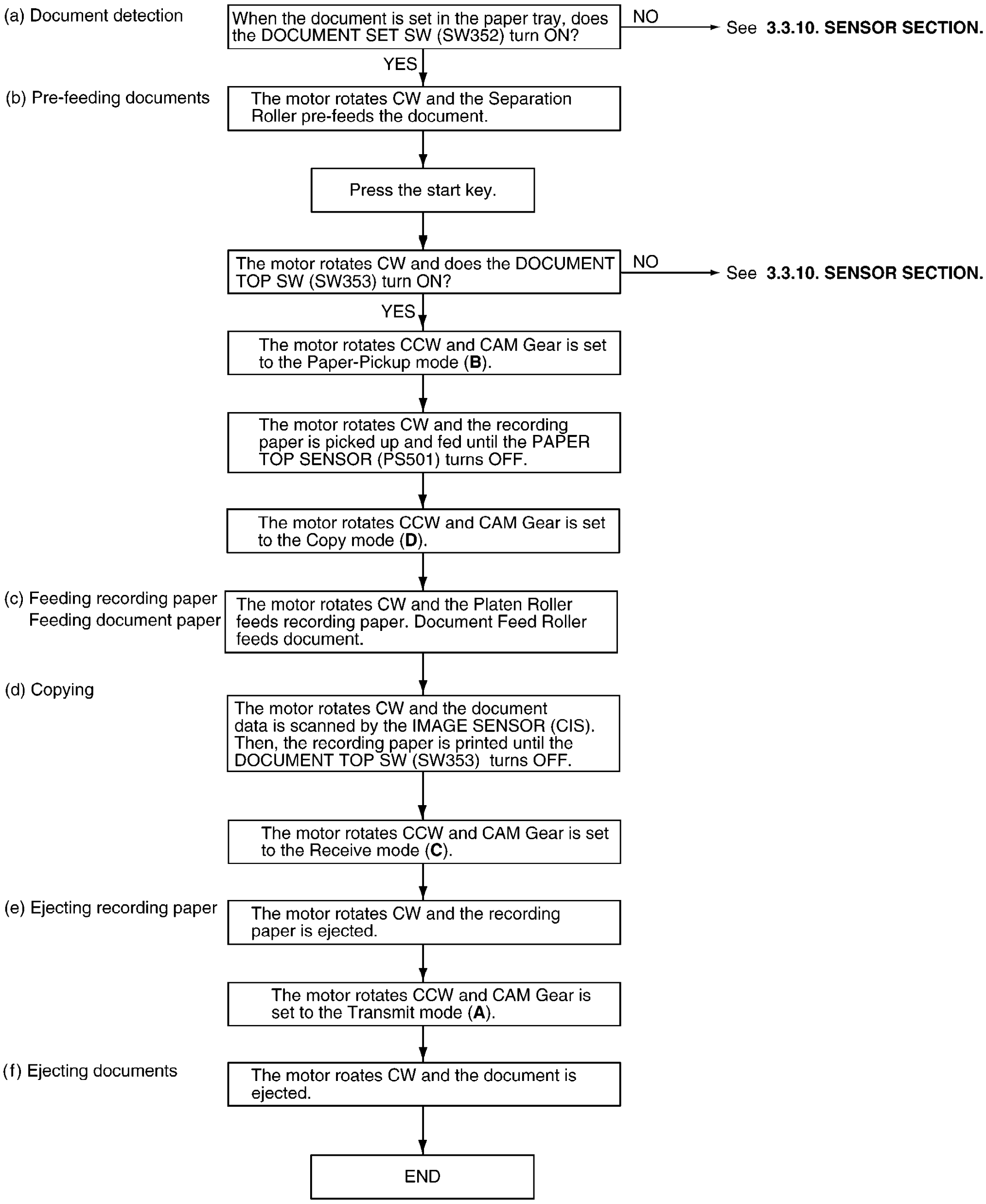
The motor rotates CCW and CAM Gear is set to the Transmit mode (**A**).

END

Note:

See “Sensor Locations” in SENSORS AND SWITCHES().

6.4.6.3.4. COPYING


(a) Document detection
When the document is set in the paper tray, does the DOCUMENT SET SW (SW352) turn ON?
NO
See 3.3.10. SENSOR SECTION.
YES
(b) Pre-feeding documents
The motor rotates CW and the Separation Roller pre-feeds the document.
Press the start key.
The motor rotates CW and does the DOCUMENT TOP SW (SW353) turn ON?
NO
See 3.3.10. SENSOR SECTION.
YES
The motor rotates CCW and CAM Gear is set to the Paper-Pickup mode (B).
The motor rotates CW and the recording paper is picked up and fed until the PAPER TOP SENSOR (PS501) turns OFF.
The motor rotates CCW and CAM Gear is set to the Copy mode (D).
(c) Feeding recording paper
Feeding document paper
The motor rotates CW and the Platen Roller feeds recording paper. Document Feed Roller feeds document.
(d) Copying
The motor rotates CW and the document data is scanned by the IMAGE SENSOR (CIS). Then, the recording paper is printed until the DOCUMENT TOP SW (SW353) turns OFF.
The motor rotates CCW and CAM Gear is set to the Receive mode (C).
(e) Ejecting recording paper
The motor rotates CW and the recording paper is ejected.
The motor rotates CCW and CAM Gear is set to the Transmit mode (A).
(f) Ejecting documents
The motor roates CW and the document is ejected.
END

Note:

See “Sensor Locations” in SENSORS AND SWITCHES().

CROSS REFERENCE:

SENSOR SECTION()

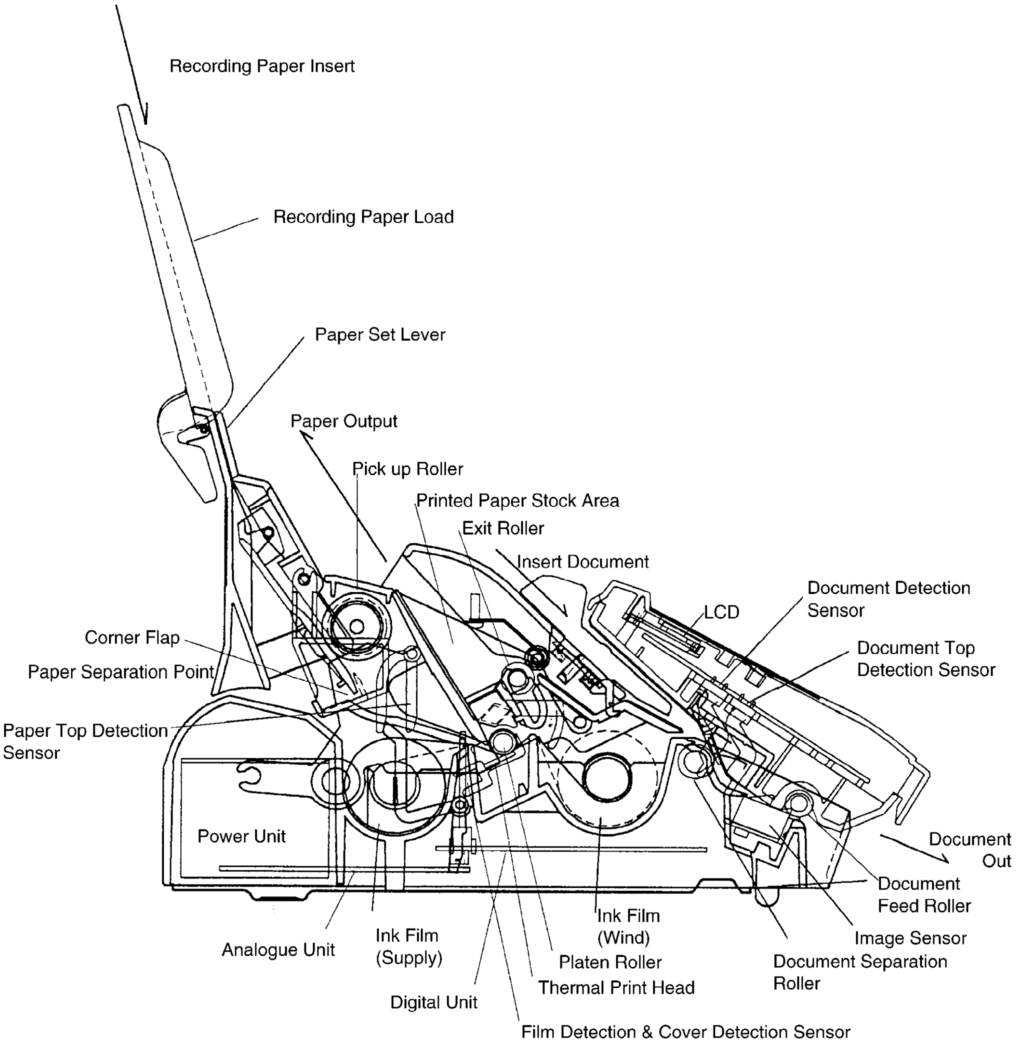
6.5. SENSORS AND SWITCHES

All of the sensor and switches are shown below.

Sensor Circuit Location	Sensor	Sensor or Switch Name	Message Error
Operation Panel	SW352	Document set SW	[CHECK DOCUMENT]
	SW353	Document top SW	[REMOVE DOCUMENT]
Digital PCB	SW501	Film End/Cover open	[CHECK COVER] or [CHECK FILM]
	PS501	Paper Top	[PAPER JAMMED]
Analogue P.C.B	SW102	Motor Position	———
	SW101	Hook	———

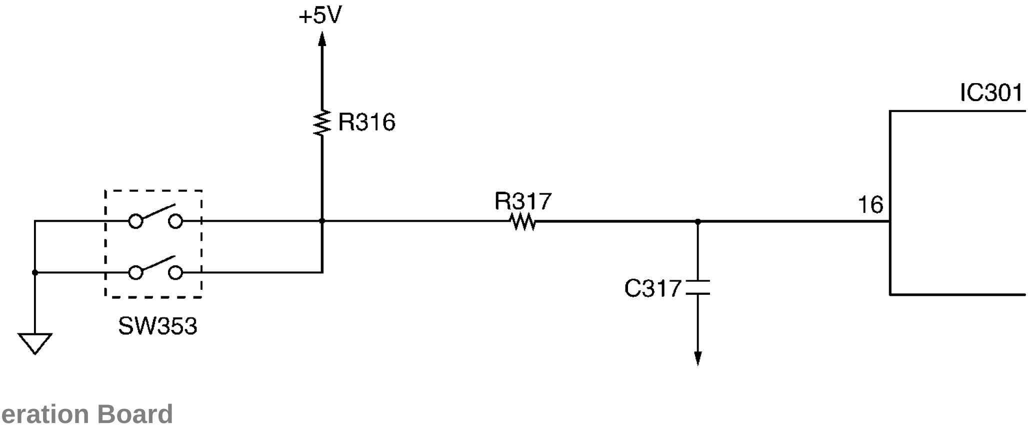
Note:
See TEST FUNCTIONS(). (#815: Sensor Check)

Sensor Locations


Recording Paper Insert
Recording Paper Load
Paper Set Lever
Paper Output
Pick up Roller
Printed Paper Stock Area
Exit Roller
Insert Document
LCD
Document Detection Sensor
Document Top Detection Sensor
Corner Flap
Paper Separation Point
Paper Top Detection Sensor
Power Unit
Document Out
Document Feed Roller
Image Sensor
Document Separation Roller
Ink Film (Wind)
Platen Roller
Thermal Print Head
Analogue Unit
Ink Film (Supply)
Digital Unit
Film Detection & Cover Detection Sensor

6.5.1. DOCUMENT TOP SW (SW353)

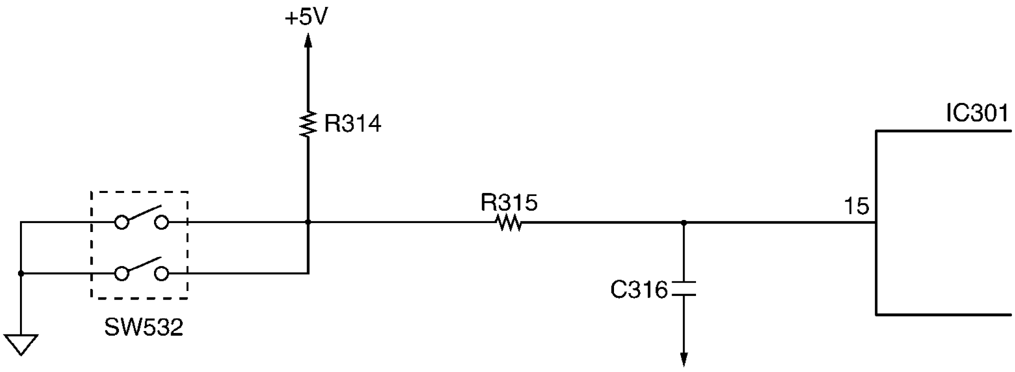
When a document is brought to the read position, the SW turns ON, and the input signal of IC301-16 pin (Operation) becomes a low level. When there is no document at the read position, the SW turns OFF, and the input signal of IC301-16 pin (Operation) becomes a high level.


+5V
R316
R317
IC301
16
C317
SW353
Operation Board

	Phototransistor	Signal (IC301-27 pin)
Out of the Read Position	OFF	High level
At the Read Position	ON	Low level

6.5.2. DOCUMENT SET (SW532)

When a document is set, the SW turns ON, and the input signal of IC301-15 pin (Operation) becomes a low level. When there is no document, the SW turns ON, and the input signal of IC301-15 pin (Operation) becomes a high level.

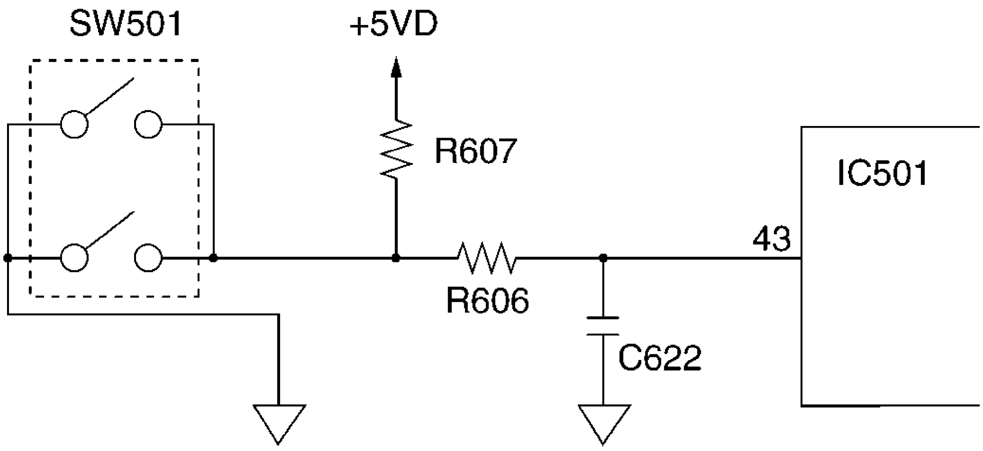


Operation Board

	Phototransistor	Signal (IC301-15 pin)
No document	OFF	High level
Set document	ON	Low level

6.5.3. COVER OPEN / FILM END SW (SW501)

When the operation panel cover is closed and a film is set, the SW turns ON, and the input signal of IC501-43 pin (Digital) becomes a low level. When the cover is opened, the SW turns OFF, and the input signal of IC501-43 pin (Digital) becomes a high level.

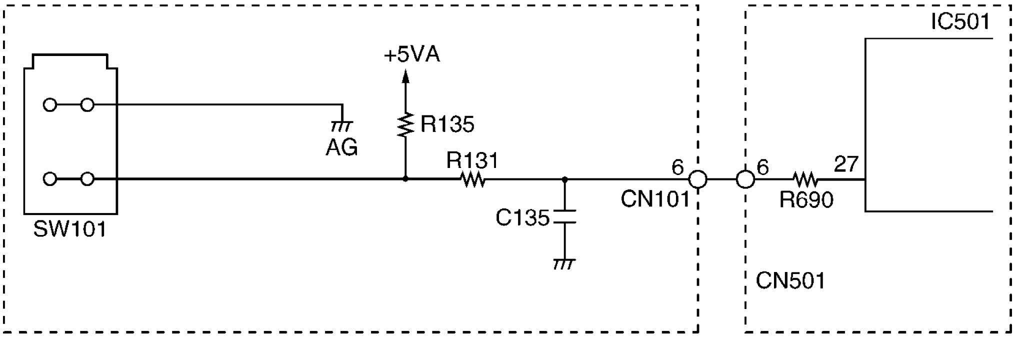


Operation Board

	Phototransistor	Signal (IC501-43 pin)
Cover open or no film	OFF	High level
Cover closed and set a film	ON	Low level

6.5.4. HOOK SWITCH (SW101)

When the handset is lifted, the switch turns ON, and the signal at pin 35 of IC501 becomes low. When the handset is returned, the switch turns OFF, and the signal at pin 35 of IC501 becomes high.


IC501
+5VA
R135
AG
R131
6
6
27
CN101
R690
C135
SW101
CN501

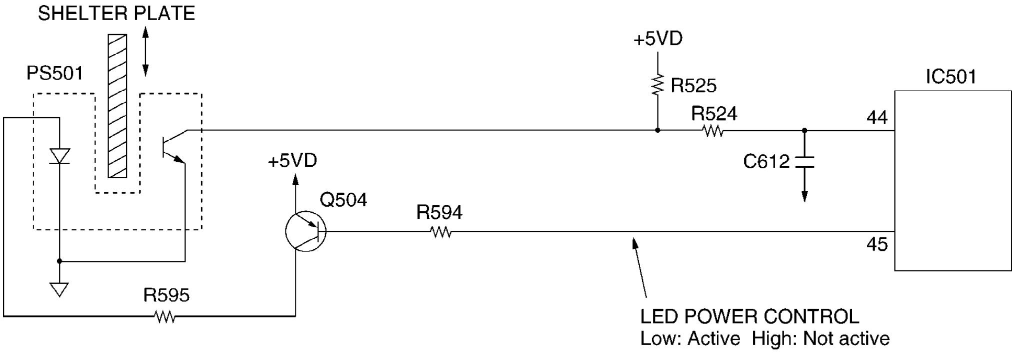
Operation Board

Operation Board

	SW	Signal (IC501-27 pin)
ON-Hook	OFF	High level
OFF-Hook	ON	Low level

6.5.5. PAPER TOP SENSOR (PS501)

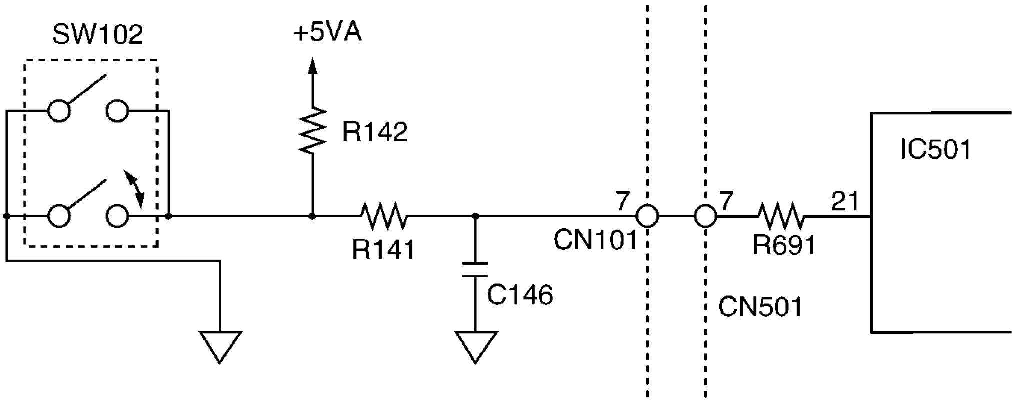
When the recording paper is loaded on the print head, the shelter plate shuts the sensor light, and the phototransistor turns OFF. The input signal of IC501-44 pin becomes a high level. Usually, the shelter plate is lifted, the phototransistor turns ON, and the input signal of IC501-44 pin becomes a low level.


SHELTER PLATE
PS501
+5VD
R525
IC501
R524
44
C612
+5VD
Q504
R594
45
R595
LED POWER CONTROL
Low: Active High: Not active

	Phototransistor	Signal (IC501-44 pin)
Set recording paper	OFF	High level
No recording paper	ON	Low level

6.5.6. MOTOR POSITION SENSOR (SW102)

This sensor is a detection switch for recording the position of the CAM.



Digital Board

	Signal (IC501-21 pin)
Home position	Low level
Other	High level

6.6. MODEM SECTION

6.6.1. FUNCTION

The unit uses a 1 chip modem (IC515) that serves as an interface between the control section for FAX transmission and reception and the telephone line. During a transmitting operation, the digital image signals are modulated and sent to the telephone line.
During a receiving operation, the analogue image signals which are received via the telephone line are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by ITU-T. This 1 chip modem (IC515) has hardware which sends and detects all of the necessary signals for FAX communication.
It can be controlled by writing commands from the CPU (IC501: inside ASIC) to the register in the modem (IC515).
This modem (IC515) also sends DTMF signals, generates a call tone (from the speaker), and detects a busy tone and dial tones.
Overview of Facsimile Communication Procedures (ITU-T Recommendation):

1. ON CCITT (International Telegraph and Telephone Consultative Committee)
The No. XIV Group of CCITT, one of the four permanent organizations of the International Telecommunications Union (ITU), investigates and make recommendations on international standards for facsimiles.

2. Definition of Each Group

- Group I (G1)

Official A-4 size documents without using formats which reduce the band width of a signal are sent over telephone lines. Determined in 1968.
Transmission for about 6 minutes at a scanning line density of

3.85 lines/mm.

- Group II (G2)

Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes.

Methods to suppress redundancy are not used.

Determined in 1976.

- Group III (G3)

Method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent within about one minute.

Determined in 1980.

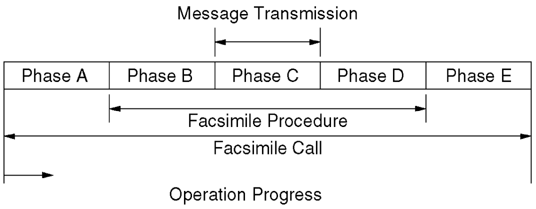
- Group IV (G4)

Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible.

The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.

3. Facsimile Call Time Series

As shown in the following diagram, the facsimile call time series is divided into five phases.



Phase A : Call setting

Call setting can be manual/automatic.

Phase B : Pre-message procedure

Phase B is a pre-processing procedure and sequence for confirming the status of the terminal, transmission route, etc., and for terminal control. It implements terminal preparation status, determines and displays terminal constants, confirms synchronization status, etc. and prepares for transmission of facsimile messages.

Phase C : Message transmission

Phase C is the procedure for the transmitting facsimile messages.

Phase D : Post message procedure

Phase D is the procedure for confirming that the message is completed and received. For continuous transmission, phase B or phase C is repeated for transmission.

Phase E : Call retrieval

Phase E is the procedure for call retrieval, that is for circuit disconnection.

4. Concerning Transmission Time

[Transmission Time] = [Control Time] + [Image Transmission Time] + [Hold Time]

Transmission time consists of the following.

Control time:

This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

Image transmission time:

This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

Hold time:

This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

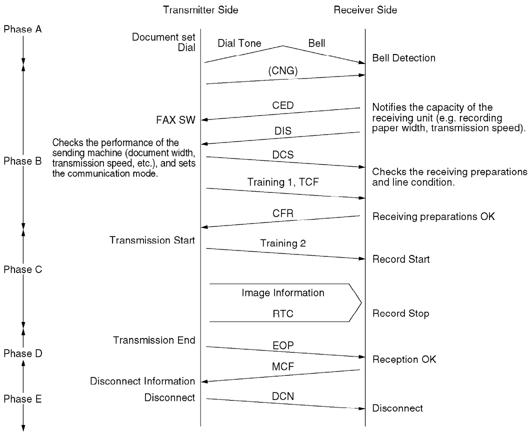
5. Facsimile Standards

Item	Telephone Network Facsimile
	G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29)
Transmission Speed	300 bps (Control Signal) 2400, 4800, 7200, 9600 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension : MH Mode 2 dimension : MR Mode (K=2.4)
Resolution	Main Scan : 8 pel/mm Sub Scan : 3.85, 7.7l/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value : 10, 20 Can be recognized in 40ms.

6. Explanation of Communication and Compression Technology

a. G3 Communication Signals (T. 30 Binary Process)

For G3 Facsimile communication, this is the procedure for exchanging control signals between the sending and receiving machines both before and after transmission of image signals.
Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1.
An example of a binary process in G3 communication is shown below.


Transmitter Side
Receiver Side
Phase A
Document set
Dial
Dial Tone
Bell
Bell Detection
(CNG)
CED
Notifies the capacity of the receiving unit (e.g. recording paper width, transmission speed).
FAX SW
DIS
Checks the performance of the sending machine (document width, transmission speed, etc.), and sets the communication mode.
Phase B
DCS
Checks the receiving preparations and line condition.
Training 1, TCF
CFR
Receiving preparations OK
Transmission Start
Training 2
Record Start
Phase C
Image Information
RTC
Record Stop
Transmission End
EOP
Phase D
Reception OK
MCF
Disconnect Information
Phase E
Disconnect
DCN
Disconnect

Explanation of Signals

Control signals are comprised mainly of 8-bit identification signals and the data signals added to them. Data signals are added to DIS and DCS signals.
Signal.....DIS (Digital Identification Signal)
Identification Signal Format.....00000001
Function:
Notifies the capacity of the receiving unit. The added data signals are as follows.
Signal.....DCS (Digital Command Signal)
Identification Signal Format.....X1000001
Example (Some models do not support the following items.):

Bit No.	DIS/DTC	DCS
1	Transmitter --- T.2 operation	
2	Receiver --- T.2 operation	Receiver --- T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter --- T.3 operation	
5	Receiver --- T.3 operation	Receiver --- T.3 operation
6	Reserved for future T.3 operation features	
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	
10	Receiver --- T.4 operation	Receiver --- T.4 operation
11, 12, 13, 14	Data signaling rate	Data signaling rate
0, 0, 0, 0	V.27 ter fall back mode	2400 bit/s, V.27 ter
0, 1, 0, 0	V.27 ter	4800 bit/s, V.27 ter
1, 0, 0, 0	V.29	9600 bit/s, V.29
1, 1, 0, 0	V.27 ter and V.29	7200 bit/s, V.29
0, 0, 1, 0	Not used	14400 bit/s, V.33
0, 1, 1, 0	Reserved	12000 bit/s, V.33
1, 0, 1, 0	Not used	Reserved
1, 1, 1, 0	V.27 ter and V.29 and V.33	Reserved
0, 0, 0, 1	Not used	14400 bit/s, V.17
0, 1, 0, 1	Reserved	12000 bit/s, V.17
1, 0, 0, 1	Not used	9600 bit/s, V.17
1, 1, 0, 1	V.27 ter and V.29 and V.33 and V.17	7200 bit/s, V.17
0, 0, 1, 1	Not used	Reserved
0, 1, 1, 1	Reserved	Reserved
1, 0, 1, 1	Not used	Reserved
1, 1, 1, 1	Reserved	Reserved
15	R8×7.7 lines/mm and/or 200×200 pels/ 25.4mm	R8×7.7 lines/mm and/or 200×200 p 25.4mm
16	Two-dimensional coding capability	Two-dimensional coding capabilit

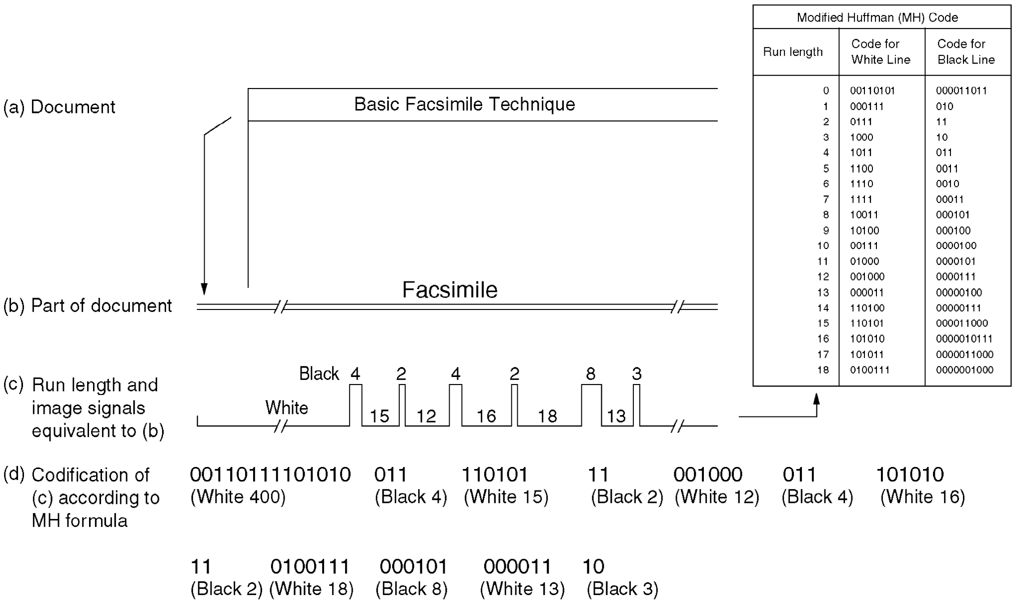
Bit No.	DIS/DTC	DCS
17, 18 (0, 0) (0, 1) (1, 0) (1, 1)	Recording width capabilities 1728 picture elements along scan line length of 215 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% 2432 picture elements along scan line length of 303 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% Invalid	Recording width 1728 picture elements along scan length of 215 mm ± 1% 2432 picture elements along scan length of 303 mm ± 1% 2048 picture elements along scan length of 255 mm ± 1% Invalid
19, 20 (0, 0) (0, 1) (1, 0) (1, 1)	Maximum recording length capability A4 (297 mm) Unlimited A4 (297 mm) and B4 (364 mm) Invalid	Maximum recording length A4 (297 mm) Unlimited B4 (364 mm) Invalid
21, 22, 23 (0, 0, 0) (0, 0, 1) (0, 1, 0) (1, 0, 0) (0, 1, 1) (1, 1, 0) (1, 0, 1) (1, 1, 1)	Minimum scan line time capability of the receiver 20 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 5 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 20 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 0 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	Minimum scan line time 20 ms 40 ms 10 ms 5 ms 0 ms
24	Extend field	Extend field
25	2400 bit/s handshaking	2400 bit/s handshaking
26	Uncompressed mode	Uncompressed mode
27	Error correction mode	Error correction mode
28	Set to "0".	Frame size 0 = 256 octets 1 = 64 o
29	Error limiting mode	Error limiting mode
30	Reserved for G4 capability on PSTN	Reserved for G4 capability on PST
31	T.6 coding capability	T.6 coding enabled
32	Extend field	Extend field

Bit No.	DIS/DTC	DCS
33 (0) (1)	Validity of bits 17, 18 Bits 17, 18 are valid Bits 17, 18 are invalid	Recording width Recording width indicated by bits Recording width indicated by this information
34	Recording width capability 1216 picture elements along scan line length of 151 ± mm 1%	Middle 1216 elements of 1728 pict elements
35	Recording width capability 864 picture elements along scan line length of 107 ± mm 1%	Middle 864 elements of 1728 pictu elements
36	Recording width capability 1728 picture elements along scan line length of 151 ± mm 1%	Invalid
37	Recording width capability 1728 picture elements along scan line length of 107 ± mm 1%	Invalid
38	Reserved for future recording width capability.	
39	Reserved for future recording width capability.	
40	Extend field	Extend field
41	R8×15.4 lines/mm	R8×15.4 lines/mm
42	300×300 pels/25.4 mm	300×300 pels/25.4 mm
43	R16×15.4 lines/mm and/or 400×400 pels/ 25.4 mm	R16×15.4 lines/mm and/or 400×40 25.4 mm
44	Inch based resolution preferred	Resolution type selection "0" : neritic based resolution "1" : inch based resolution
45	Metric based resolution preferred	Don’t care
46	Minimum scan line time capability for higher resolutions "0" : $T_{15.4} = T_{7.7}$ "1" : $T_{15.4} = 1/2T_{7.7}$	Don’t care
47	Selective Polling capability	Set to "0".
48	Extend field	Extend field

Note 1 - Standard facsimile units conforming to T.2 must have the following capability : Index of cooperation (IOC)=264.
Note 2 - Standard facsimile units conforming to T.3 must have the following capability : Index of cooperation (IOC)=264.
Note 3 - Standard facsimile units conforming to T.4 must have the following capability : Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	—	**A fixed pattern is transmitted to the receivin at a speed (2400 to 9600 bps) designated by and the receiving side optimizes the automa equalizer, etc., according to this signal.**
TCF **(Training Check)**	—	**Sends 0 continuously for 1.5 seconds at the speed as the training signal.**
CFR **(Confirmation to Receive)**	**X0100001**	**Notifies the sending side that TCF has been properly received. If TCF is not properly rece FTT (Failure To Train) X0100010 is relayed to sender. The sender then reduces the transmission speed by one stage and initiate training once again.**
Training 2	—	**Used for reconfirming the receiving side like training 1.**
Image Signal	**Refer to the next page.**	—
RTC **(Return to Control)**	—	**Sends 12 bits (0...01 × 6 times) to the receive the same speed as the image signal and noti completion of transmission of the first sheet**
EOP **(End of Procedure)**	**X1110100**	**End of one communication**
MCF **(Message Confirmation)**	**X0110001**	**End of 1 page reception**
DCN **(Disconnect)**	**X1011111**	**Phase E starts.**
MPS **(Multi-Page Signal)**	**X1110010**	**Completion of transmission of 1 page. If ther still more documents to be sent, they are out instead of EOP. After MCF reception, the sen transmits an image signal of the second she**
PRI-EOP **(Procedural Interrupt-EOP)**	**X1111100**	**If there is an operator call from the sender, it output after RTC.**
PIP **(Procedural Interrupt Positive)**	**X0110101**	**This is output when an operator call is recei**

b. Redundancy Compression Process Coding Mode
This unit uses one-dimensional MH format.


(a) Document
Basic Facsimile Technique
(b) Part of document
Facsimile
(c) Run length and image signals equivalent to (b)
Black 4 2 4 2 8 3
White 15 12 16 18 13
(d) Codification of (c) according to MH formula
001101111101010 (White 400)
011 (Black 4)
110101 (White 15)
11 (Black 2)
001000 (White 12)
011 (Black 4)
101010 (White 16)
11 (Black 2)
0100111 (White 18)
000101 (Black 8)
000011 (White 13)
10 (Black 3)

Modified Huffman (MH) Code

Run length	Code for White Line	Code for Black Line
0	00110101	000011011
1	000111	010
2	0111	11
3	1000	10
4	1011	011
5	1100	0011
6	1110	0010
7	1111	00011
8	10011	000101
9	10100	000100
10	00111	0000100
11	01000	0000101
12	001000	0000111
13	000011	00000100
14	110100	00000111
15	110101	000011000
16	101010	0000010111
17	101011	0000011000
18	0100111	0000001000

(c) Total bit number before MH codification (497 bit)
(d) Total bit number after MH codification (63 bit)

6.6.2. MODEM CIRCUIT OPERATION

The modem (IC515) has all the hardware satisfying the ITU-T standards mentioned previously. When the ASIC IC501 (61) is brought to a low level, the modem (IC515) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC501) ADR0-ADR4(pin 83~87). Commands are written through the data bus, and all processing is controlled by the ASIC (IC501) according to ITU-T procedures. Here, the INT signal dispatched from IRQ (pin 108/121 of IC515) to the ASIC (IC501) implements post processing.

This modem (IC515) has an automatic application equalizer. With training signal 1 or 2 at the time of G3 reception, it can automatically establish the optimum equalizer. The modem (IC515) operates using the 32.256MHz clock (X503).

1. Facsimile Transmission/DTMF Line Send

The digital image data on the data bus is modulated in the modem (IC515), and sent from pin 69 via Analogue ASIC IC514(24 → 22), amplifier IC101(6 → 7) and the NCU section to the telephone line. Refer to CHECK SHEET().

2. Facsimile Reception

The analogue image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC515). The signals that enter pin 60 of the modem (IC515) are demodulated in the board to digital image signals, then placed on the data bus.

In this case, the image signals from the telephone line are transmitted serially. Hence, they are placed on the bus in 8 bit

units. Here, the internal equalizer circuit reduces the image signals to a long-distance receiving level.
This is designed to correct the characteristics of the frequency band centreed around 3 kHz and maintain a constant receiving sensitivity.
It can be set in the service mode.
Refer to CHECK SHEET().

3. DTMF Transmission (Monitor tone)
The DTMF signal generated in the modem (IC515) is output from pin 69, and the NCU section to the telephone line the same as facsimile transmission signals.
(DTMF Monitor Tone)
Refer to CHECK SHEET().

4. Busy/Dial Tone Detection
The path is the same as FAX receiving. When it is detected, the carrier detect bit of the resistor in the modem (IC515) becomes 1, and this status is monitored by ASIC (IC501).

5. Caller ID Detection
The caller ID signal which is received from the telephone line / passes through the monitor trans T102 and Analogue ASIC (IC514).
And it enters pin 62 of the modem (IC515).

6.7. DESCRIPTION OF BLOCK DIAGRAM IN ANALOGUE SECTION

1. Function
The analogue section serves as an interface between the telephone line. The digital board (IC515) for transmission and reception of FAX signals, switches between the digital board (IC515) and other sections by means of a Analogue ASIC (IC514) in the NCU section. The control signals to the individual analogue sections are output mainly from ASIC IC501, and the status information for the various sections is also held in ASIC IC501. Simple explanations for the various sections are given below.

2. Circuit Operation

[NCU Section]

This is the interface between the telephone line and external telephone. This is composed of a

bell detection circuit, pulse dial generation circuit, amplifier circuit for line transmission and reception, sidetone circuit, etc.

[Modem (IC515)]

This is used for FAX signal tone modulation, DTMF signal transmission, ring tone generation, and line transmission beep generation. The DTMF signal and beep are placed into the TX system. The ring tone passes through the analogue ASIC(IC514) and is output to the speaker via the power amplifier (IC102).

6.7.1. ANALOGUE UNIT BLOCK DIAGRAM

6.8. NCU SECTION

6.8.1. GENERAL

This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RL101), bell detection circuit, pulse dial circuit, TAM interface circuit, line amplifier and sidetone circuits.

6.8.2. EXT. TEL. LINE RELAY (RL101)

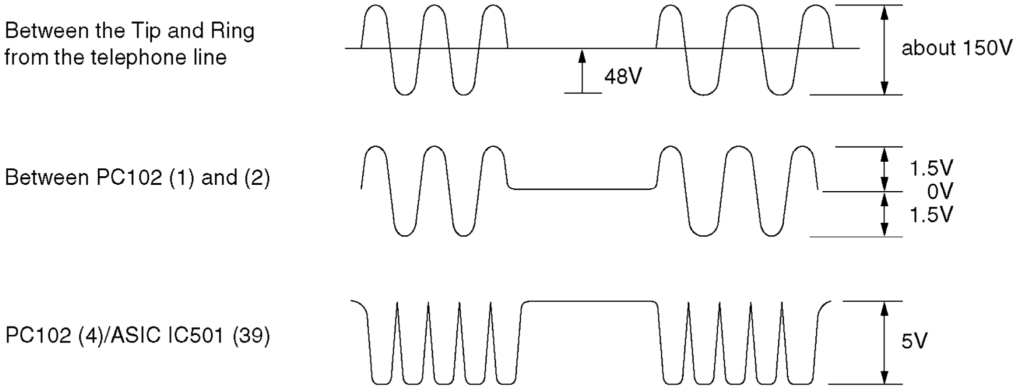
1. Circuit Operation

Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.
{ IC501 (38) High Level → R647 → CN501 (3) High Level } → CN101 (3) High Level → Q115 ON → RL101 (make)

6.8.3. BELL DETECTION CIRCUIT

1. Circuit Operation

The signal waveform for each point is indicated below. The signal (low level section) input to pin 39 of ASIC IC501 on the digital board is read by ASIC and judged as a bell.
TEL LINE → PC102 (1, 2 - 4) → CN101(2) → {IC501 (2) → IC501(39)}



6.8.4. TAM INTERFACE CIRCUIT

This circuit is to switch between FAX receiving and the external TAM's message recording automatically. This circuit consists of a monitor transformer, ANALOGUE ASIC (IC514) and MODEM (IC515).
For details, please refer to TAM INTERFACE SECTION().

6.8.5. PULSE DIAL CIRCUIT AND ON/OFF HOOK CIRCUIT

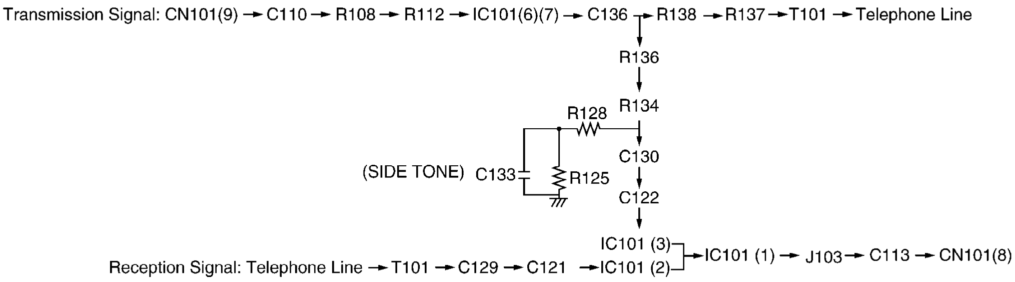
In OFF - HOOK condition
IC501(16) → LOW LEVEL(MAKE) → PC105 ON (MAKE) → Q116 ON (MAKE) → TEL LINE
IC501(16) → HIGH LEVEL(BREAK) → PC105 OFF (BREAK) → Q116 OFF (BREAK) → TEL LINE

6.8.6. LINE AMPLIFIER AND SIDE TONE CIRCUIT

1. Circuit Operation

The reception signal output from the line transformer T101 is input to pin (2) of IC101 via C129 and C121, and then the signal is amplified at pin (1) of IC101 and sent to the reception system at 8.5dB.
The transmission signal goes through C110, R108 and R112 and enters IC101-pin (6), where the signal is amplified to about 20.8dB. Then, it is output from pin (7) of IC101 and transmitted to T101 via C136, R138 and R137. If the side tone circuit is not applied, the transmission signal will return to the reception amplifier via C129 and C121. When the side tone circuit is active, the signal output from IC101 pin (1) passes through R136, R134, C130 and C122 and goes into the amplifier IC101 pin (3). This circuit is used to cancel the transmission return signal.

Side Tone Circuit


Transmission Signal: CN101(9) → C110 → R108 → R112 → IC101(6)(7) → C136 → R138 → R137 → T101 → Telephone Line
R136
R128
R134
C130
(SIDE TONE)
C133
R125
C122
IC101 (3)
IC101 (2)
IC101 (1) → J103 → C113 → CN101(8)
Reception Signal: Telephone Line → T101 → C129 → C121 →

6.8.7. CALLING LINE IDENTIFICATION CIRCUIT

Note:
The Caller ID service is currently not available in Portugal, January 2002.

1. Function

This unit is compatible with the Caller ID service offered by your local telephone company. To use this feature, you must subscribe to a Caller ID service. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

There are two type of the message format which can be received: i.e.the single data message format and multiple data message format.

The multiple data format allows to transmit the name and data code information in addition to the time and telephone number data.

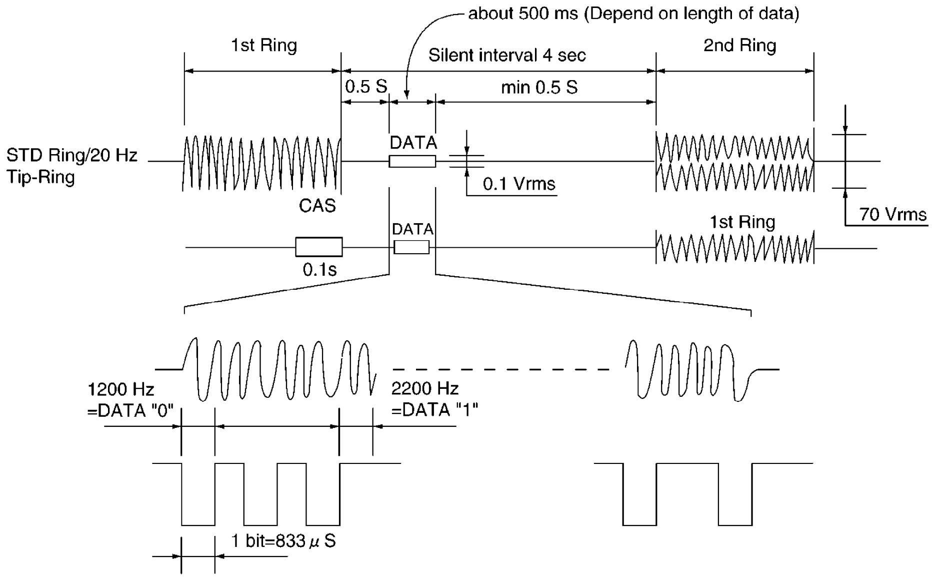
When there is multiple data in the unit, the name or telephone number are displayed.

2. Circuit Operation:

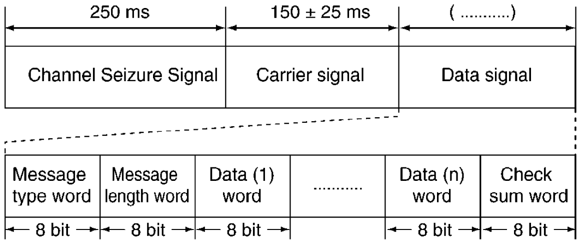
The caller ID signal input from TEL LINE is processed with MODEM (IC515).

Refer to ANALOGUE BOARD SECTION () for the route of caller ID signal.

Timing Chart


about 500 ms (Depend on length of data)
1st Ring
Silent interval 4 sec
2nd Ring
0.5 S
min 0.5 S
STD Ring/20 Hz
Tip-Ring
DATA
0.1 Vrms
CAS
DATA
1st Ring
70 Vrms
0.1s
1200 Hz
=DATA "0"
2200 Hz
=DATA "1"
1 bit=833 μ S

- **Single data message**

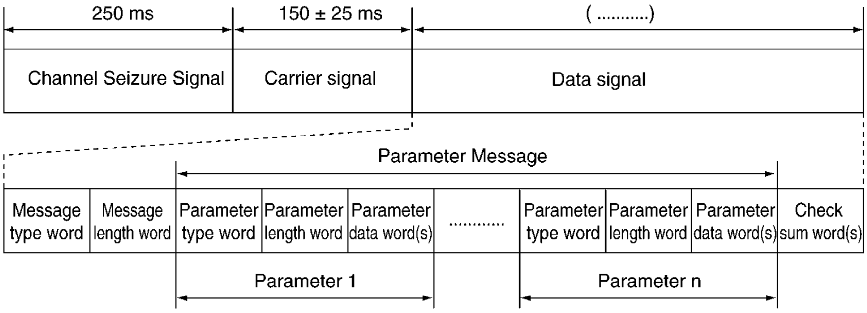


250 ms	150 ± 25 ms	(...........)
Channel Seizure Signal	Carrier signal	Data signal

Message type word	Message length word	Data (1) word	....	Data (n) word	Check sum word
8 bit	8 bit	8 bit		8 bit	8 bit

- •1 word = All 8 bit data
- •Message Type Word = Fixed value "00000100"
- •Message Length Word = number of the data word
- •Data word = The data value (month, day, hour, minute, telephone number)

· **Multiple data message**



250 ms	150 ± 25 ms	(...........)
Channel Seizure Signal	Carrier signal	Data signal

		Parameter Message							
Message type word	Message length word	Parameter type word	Parameter length word	Parameter data word(s)	....	Parameter type word	Parameter length word	Parameter data word(s)	Check sum word(s)
		Parameter 1				Parameter n			

- ·1 word = All 8 bit data
- ·Message Type = Fixed value "10000000"
- ·Message Length Word = number of the Parameter Message word
- ·Parameter Type Word = Kind of data (ex. the time, phone number)
- ·Parameter Length Word = number of the Parameter data word
- ·Parameter Word (s) = the data value

6.9. ITS (Integrated Telephone System) AND MONITOR SECTION

6.9.1. GENERAL

During the monitor operation, the speaker output passes through the power amplifier (IC102) [Analogue board].
The DTMF signal is output from the modem (IC505: digital board). The alarm tone, the key tone, bell tone, and beep are output from gate array IC501 (digital board). During a pulse dial operation, the monitor tone is output from gate array IC501.

6.9.2. TELEPHONE MONITOR

1. Function

This is the function when you are not holding the handset and can hear the caller’s voice from the line.

2. Signal path

Refer to CHECK SHEET().

6.9.3. HANDSET CIRCUIT

1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

2. Signal path (Transmission signal)

Refer to CHECK SHEET().

3. Signal path (Reception signal)

Refer to CHECK SHEET().

6.9.4. MONITOR CIRCUIT

1. Function

This circuit monitors various tones, such as 1 DTMF tone,2 Alarm/ Beep/Key tone/Bell 3 Dummy ring back tone.

2. Signal path

A. DTMF MONITOR

(Speaker Operation)

Refer to CHECK SHEET().

(Handset Operation)

Refer to CHECK SHEET().

B. ALARM/BEEP/KEY TONE/BELL

Refer to CHECK SHEET().

C. DUMMY RING BACK TONE

Refer to CHECK SHEET().

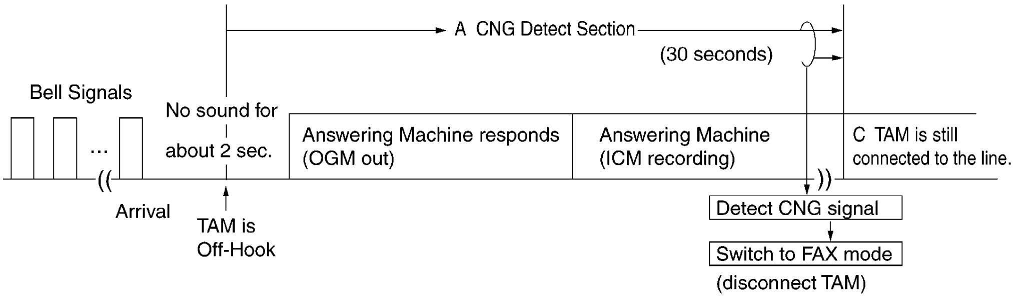
6.10. TAM INTERFACE SECTION

6.10.1. FUNCTION

The unit receives documents for FAX calls or the external TAM records a voice message automatically.

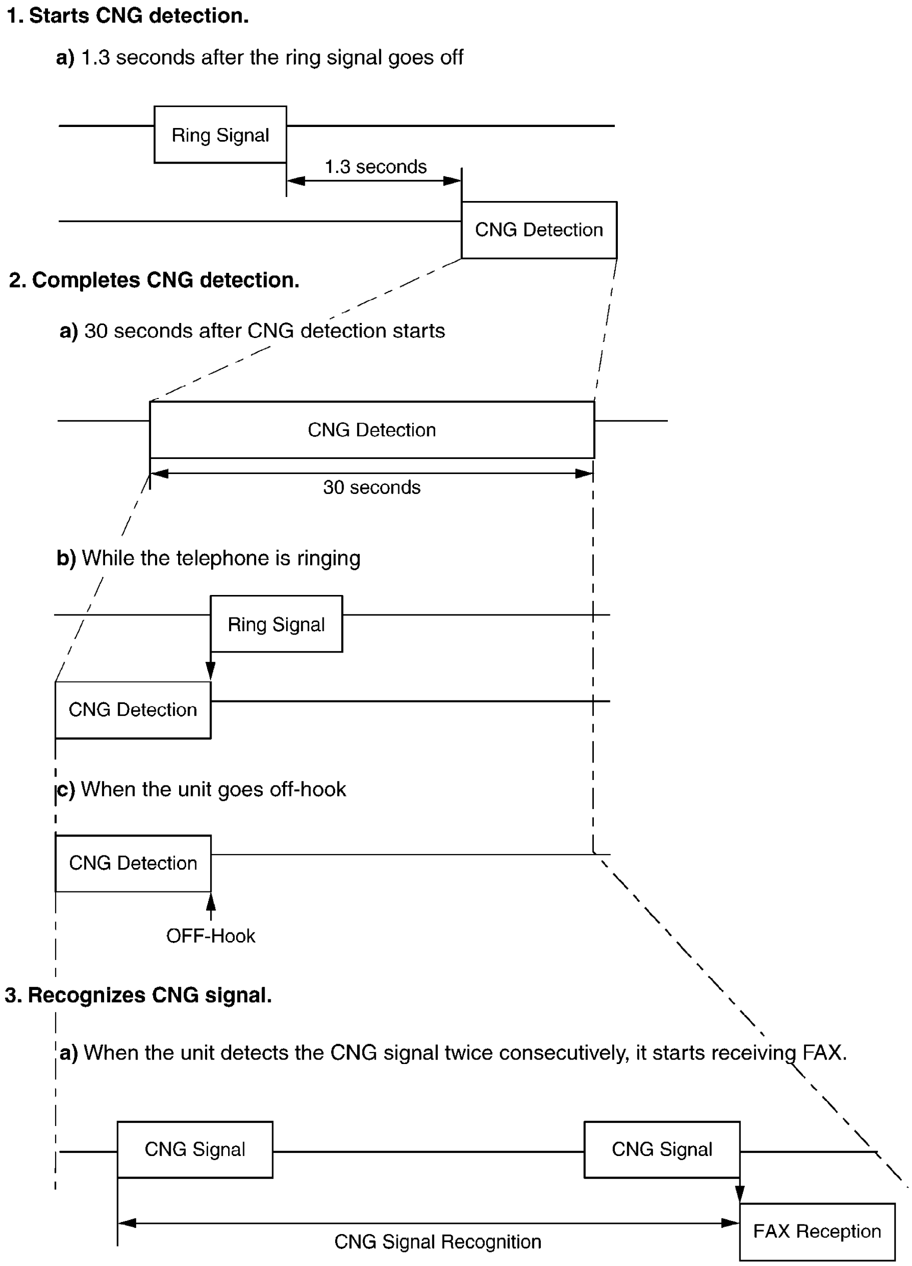
To switch between the answering machine and facsimile.

#	EXTERNAL TAM OPERATION	UNIT OPERATION
1	When the bell signal rings as many times as the number memorized into the connected answering machine (TAM), the answering machine is connected to the line and the answering message is sent out to the line.	While the message is being played, the unit starts to detect the CNG signal.(A) If the unit detects the CNG signal, it will switch to FAX receiving and disconnect the external TAM automatically.


A CNG Detect Section
(30 seconds)
Bell Signals
No sound for
about 2 sec.
Answering Machine responds
(OGM out)
Answering Machine
(ICM recording)
C TAM is still
connected to the line.
Arrival
TAM is
Off-Hook
Detect CNG signal
Switch to FAX mode
(disconnect TAM)

6.10.2. USER-FRIENDLY RECEPTION FOR PARALLEL-CONNECTED TELEPHONE

When CNG signal is transmitted from the other party's phone after a parallel-connected phone or an external phone goes OFF-Hook while the telephone is ringing, the machine automatically starts receiving FAX.


1. Starts CNG detection.
a) 1.3 seconds after the ring signal goes off
Ring Signal
1.3 seconds
CNG Detection
2. Completes CNG detection.
a) 30 seconds after CNG detection starts
CNG Detection
30 seconds
b) While the telephone is ringing
Ring Signal
CNG Detection
c) When the unit goes off-hook
CNG Detection
OFF-Hook
3. Recognizes CNG signal.
a) When the unit detects the CNG signal twice consecutively, it starts receiving FAX.
CNG Signal
CNG Signal
CNG Signal Recognition
FAX Reception

6.10.3. CIRCUIT OPERATION

The TAM INTERFACE circuit consists of CNG signal from the other party's detection circuit, and RL101 (to separate EXT. TAM).

1. CNG signal detection circuit

The CNG signal from the other party's FAX is detected in MODEM IC515 (digital board).

(Signal path)

Refer to CHECK SHEET().

2. Remote receiving

This is the parallel or series connected DTMF signal for the TEL or

EXT.TEL mode between a and b. When the other party is a FAX, the unit switches to FAX receiving.

(Signal Path)

Detects the DTMF signal in the MODEM.

6.11. OPERATION BOARD SECTION

The unit consists of a LCD (Liquid crystal display), KEYs and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC301) and ASIC (IC501: on the DIGITAL BOARD). (Fig.-a)

The key matrix table is shown below.

Key Matrix

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	KIN7
KSL0	SW301 FAX / START / SET	SW305 FLASH	SW310 REDIAL / PAUSE	SW315 MUTE	SW320 SP-PHONE / MONITOR			SW328 AUTO ANSWER
KSL1	SW302 CALLER-ID	SW306 1	SW311 2	SW316 3				SW329 Not Used
KSL2	SW303 COPY	SW307 7	SW312 8	SW317 9	SW321 →	SW323 (+)	SW326 MENU	SW330 Not Used
KSL3	SW304 STOP	SW308 4	SW313 5	SW318 6			SW327 HELP	SW331 Not Used
KSL4		SW309 *	SW314 0	SW319 #	SW322 (—)	SW324 ←		

XL

	XL12	XL11
	DOCUMENT SET	DOCUMENT TOP

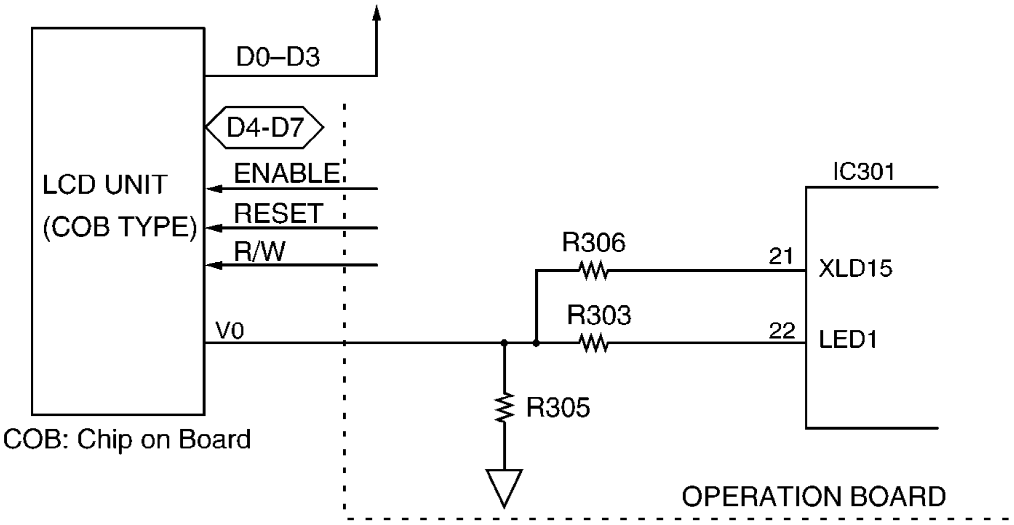
6.12. LCD SECTION

The Gate Array (IC301) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive.

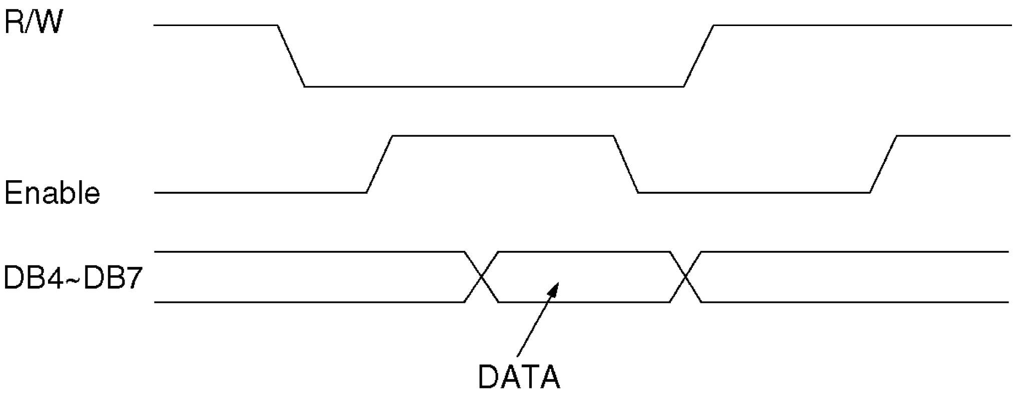
R303(R377) and R305(R379) are density control resistors.

Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC301).

Circuit Diagram



Timing Chart

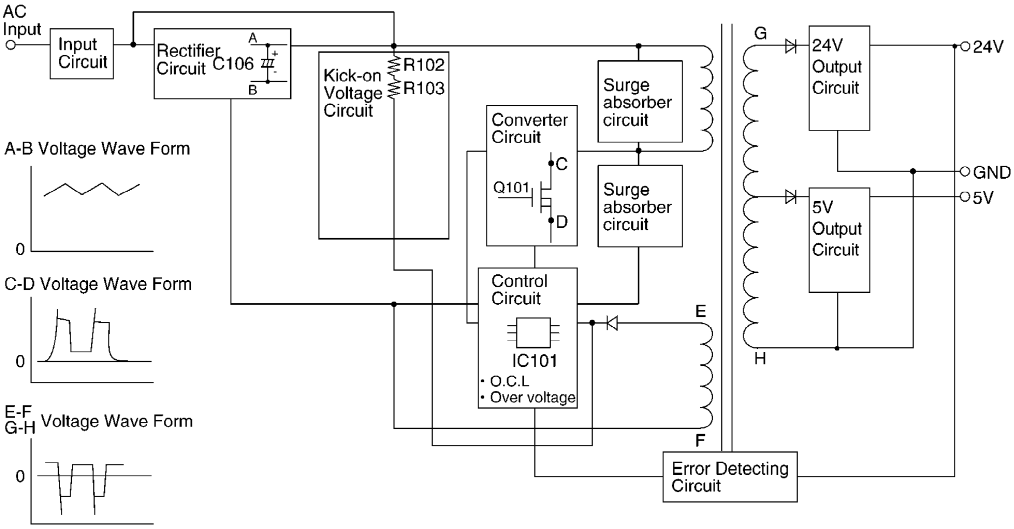

R/W
Enable
DB4~DB7
DATA

DIsplay mode	Density	Normal	Dark
2 lines (X1. 0)	LED1 (IC301-22pin)	H	L
	XLD15 (IC301-21pin)	L	L
X1. 5	LED1	H	H
	XLD15	Hi-Z	L

6.13. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.

Block Diagram


AC Input
Input Circuit
Rectifier Circuit
C106
A
B
Kick-on Voltage Circuit
R102
R103
Converter Circuit
Q101
C
D
Surge absorber circuit
Surge absorber circuit
Control Circuit
IC101
• O.C.L
• Over voltage
E
F
G
H
24V Output Circuit
5V Output Circuit
24V
GND
5V
Error Detecting Circuit
A-B Voltage Wave Form
0
C-D Voltage Wave Form
0
E-F
G-H Voltage Wave Form
0

[Input Circuit]

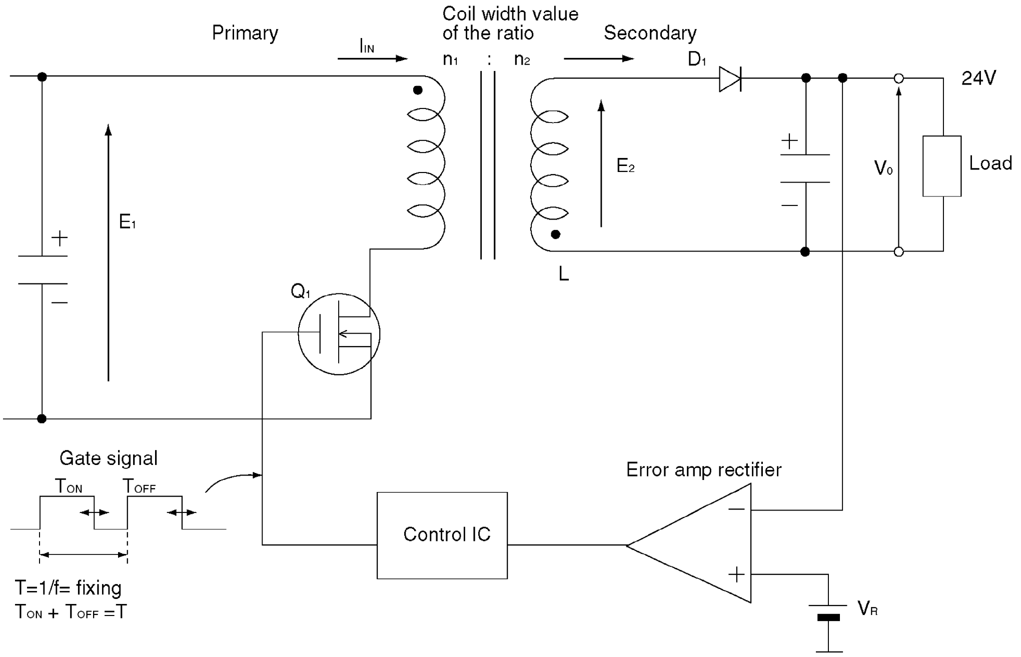
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

[Rectifier Circuit]

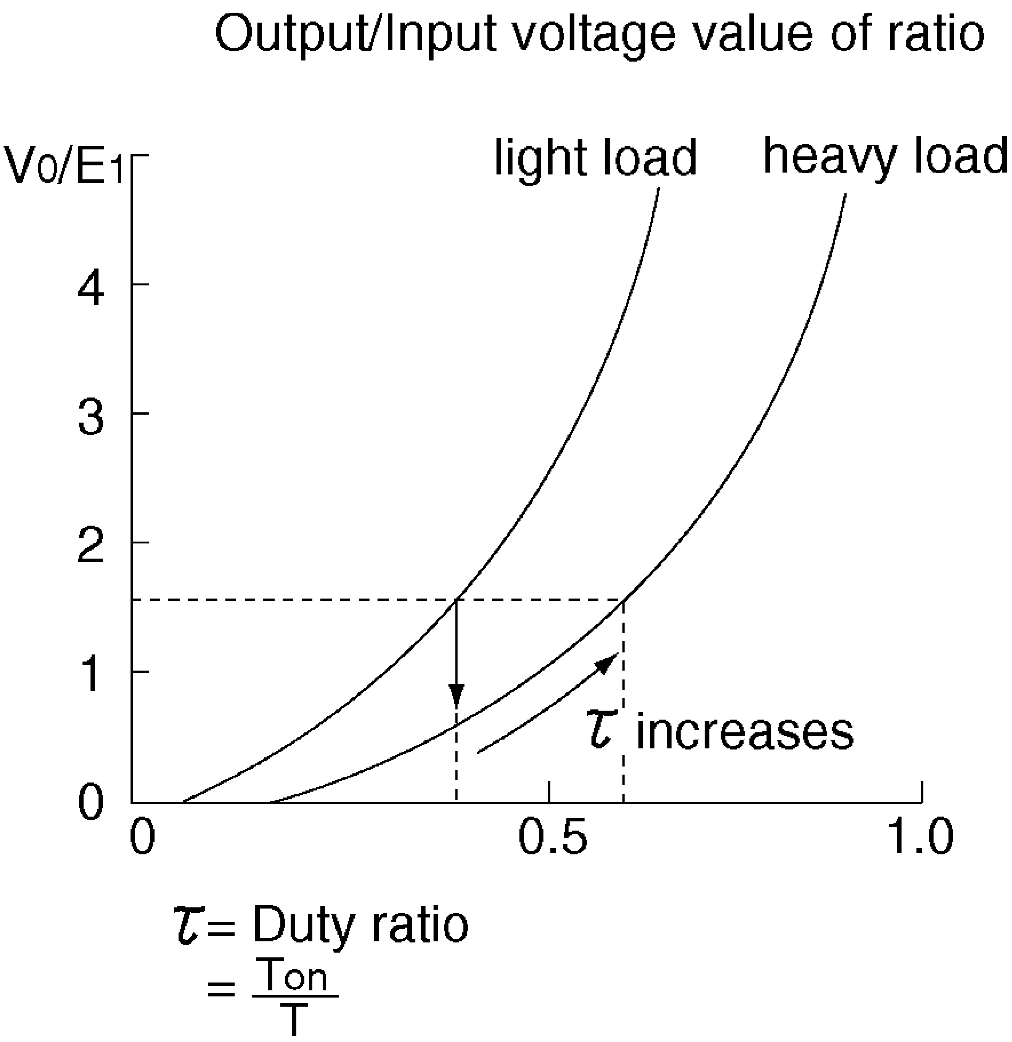
The input current is rectified by D101,D102,D103 and D104 and charges C106 to make DC voltage. Then it supplies power to the converter circuit.

[Kick-on voltage circuit]

Bias is applied to the Q101 gate via this circuit when the AC power is turned on and Q101 begins operating.


Coil width value of the ratio
Primary
Secondary
I_{IN}
n_1 : n_2
D_1
24V
E_2
V_0
Load
+
−
E_1
L
Q_1
Gate signal
T_{ON}
T_{OFF}
T=1/f= fixing
T_{ON} + T_{OFF} =T
Error amp rectifier
Control IC
V_R

The following is an overview of how the power supply unit is controlled.
The control method of this power supply unit is pulse width modulation.
When Q_1 is ON, the energy is charged in the transfer primary coil according to E_1. When Q_1 is OFF, the energy is output from the secondary transfer as follows.
L → D_1 → Load → L
Then the power is supplied to the Load. When Q_1 is ON, power is not output from the secondary side. The output voltage is fed back in the control IC according to the error amp rectifier. Then depending on how T_{ON} is controlled, stabilization occurs. Also, when the current load becomes too large, in order to decrease the voltage output, the increase in τ is controlled and the output voltage is stabilized.
Therefore, basically the timing: Ton/Toff of Q1 controls the output voltage.



[Surge Absorber Circuit]

This circuit is for absorbing surge voltage generated by the transformer.

[Control Circuit and Detecting Circuit]

The control circuit amplifies the output with increased voltage detected in the error detecting circuit. Then it drives the main transistor.

In this power supply, the duty ratio is defined by changing the ON period of the main transistor. This is shown as follows.

When the output voltage of the 24V circuit increases, the current of the photo coupler PC101 increases, the pulse width of the output control IC becomes narrower and the ON period of Q101 becomes shorter.

[Over Current Limiter (O.C.L)]

The highest drain current (Q101) is limited by a limiter circuit (IC101) of 24V. The 24V output is limited by this circuit.

[Over Voltage Circuit]

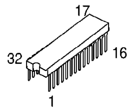
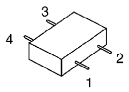
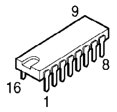
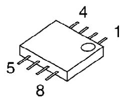
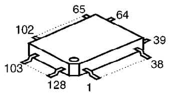
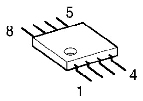
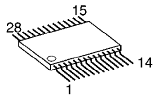
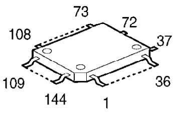
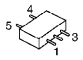
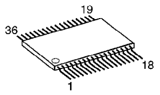
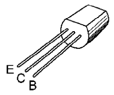
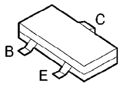
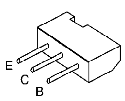
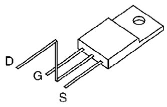
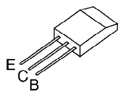
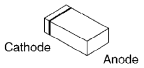
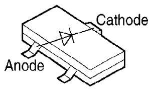
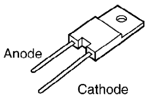
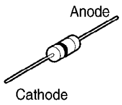
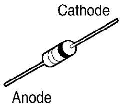
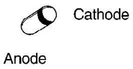
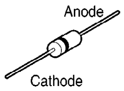
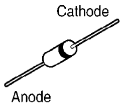
If the 24V output increases because the error detecting circuit or control circuit is broken, IC101 will recognize this signal and output becomes 0V.

Dummy load method (to quickly check the power supply output)

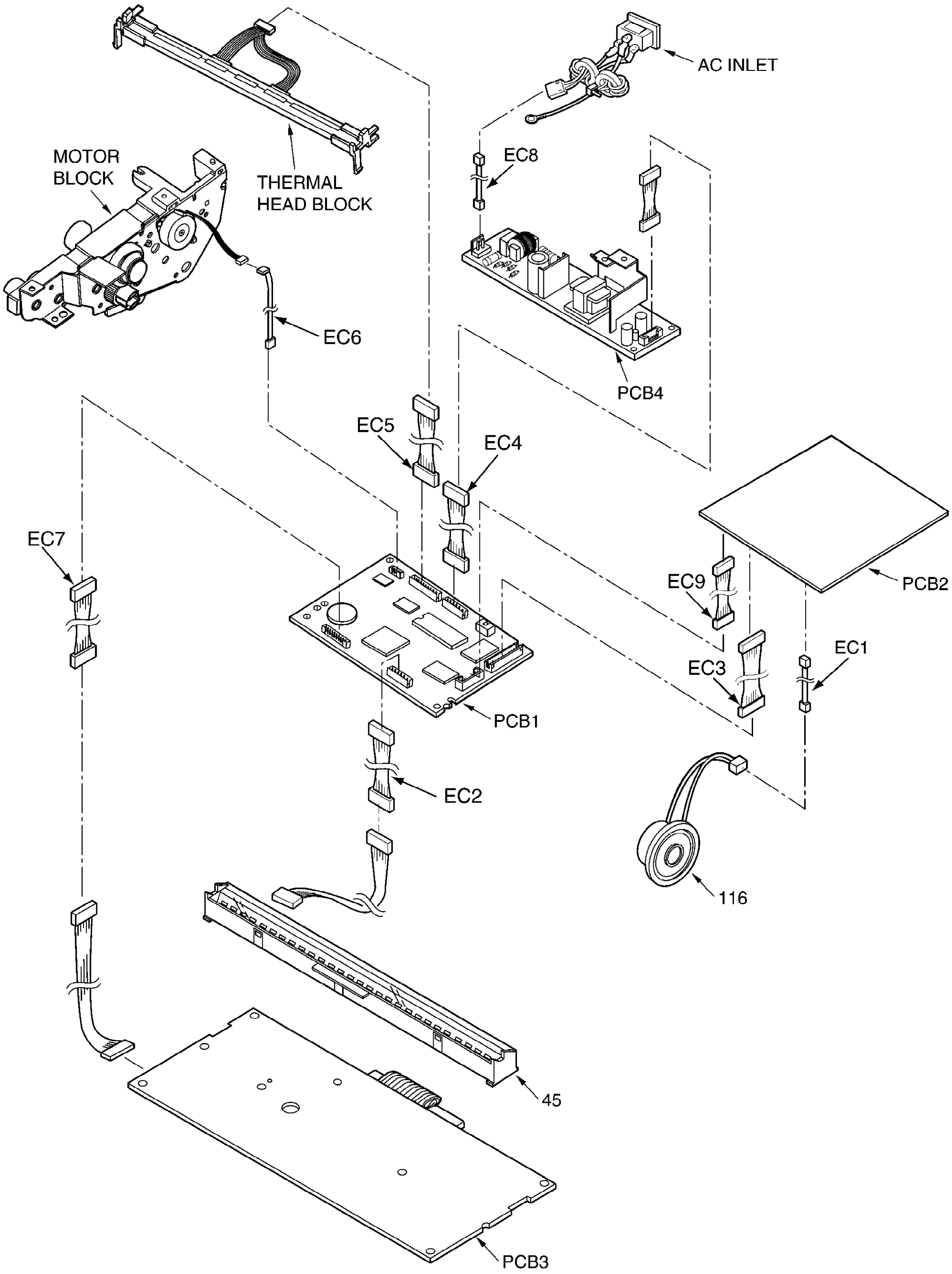
Refer to POWER SUPPLY BOARD SECTION().

7. TERMINAL GUIDE OF THE ICs TRANSISTORS

AND DIODES

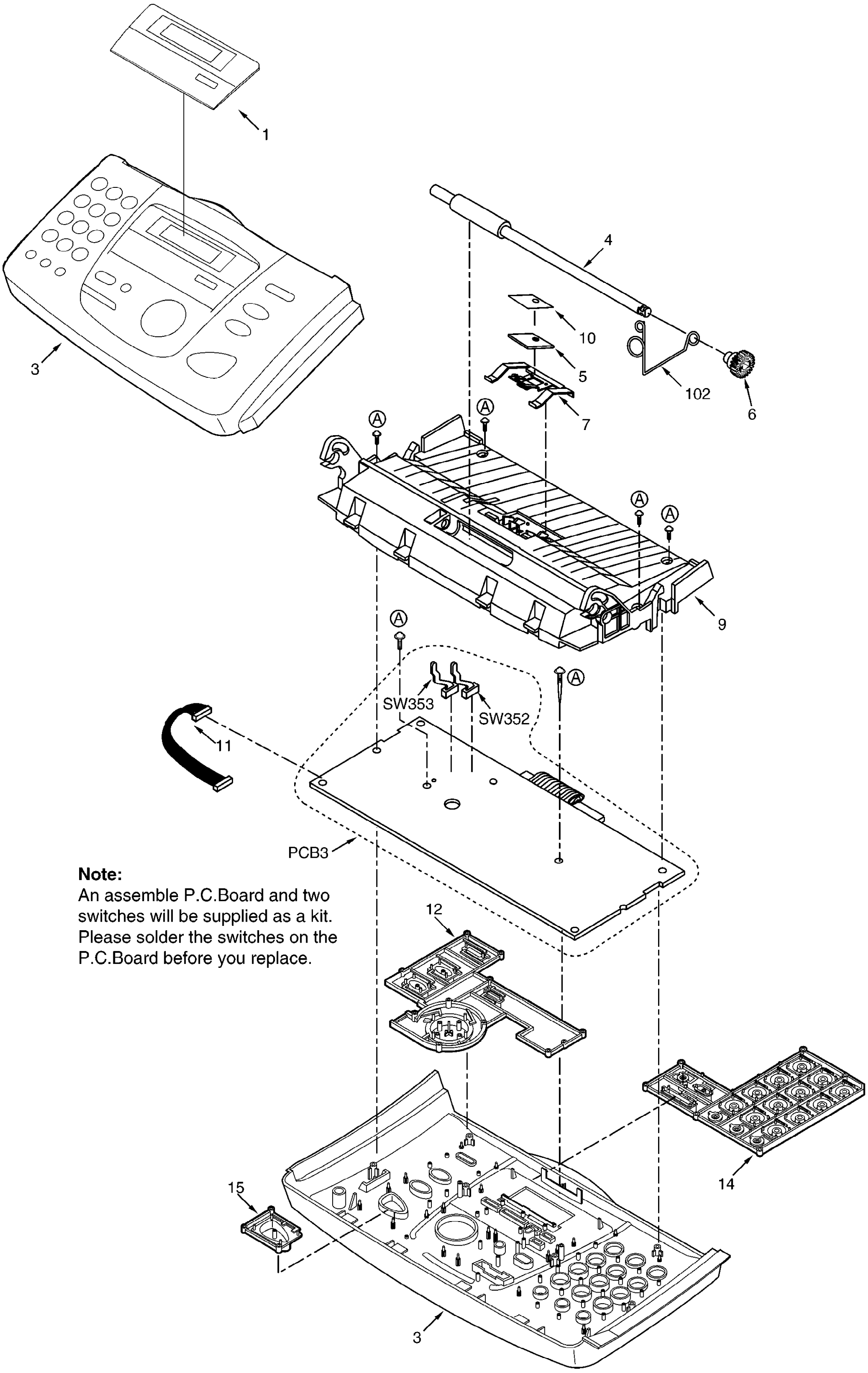
 PFWIFP151E PFWIFP151GR PFWIFP151SP	 PFVIXCN4202N	 PFVIT2003APS	 PFVTSI4431DY	 65 64 102 39 103 38 128 1 PFVIR676812
 AN6183SE1 PQVINJM2113M PFVINJM082BM	 PFVIM0525LFF PFVIMS5148EF	 73 108 72 37 109 36 144 1 PFVIM66440M1	 PQVIMM1385EN	 AN6383SB
 2SC2235	 PQVTDTC143E PQVTDTC114EU 2SB709A, 2SC4155S 2SC4155R, 2SB1218A	 2SB1322	 2SK2651	 2SA1627
 Cathode Anode MA143	 Cathode Anode MA141WK	 Anode Cathode PFVDSF5LC20U	 Anode Cathode MA7160, PFVD1N4005 MA4220, PFVDD1NL20U	 Cathode Anode PFVDRMRLS245 PQVDHZS2B1, MA4056
 Cathode Anode RLS71	 Anode Cathode PQVDERA1802 PFVDEG01C, MA165	 Cathode Anode 1SS119		

8. FIXTURES AND TOOLS


AC INLET
MOTOR BLOCK
THERMAL HEAD BLOCK
EC8
EC6
PCB4
EC5
EC4
EC7
EC9
PCB2
EC1
EC3
PCB1
EC2
116
45
PCB3

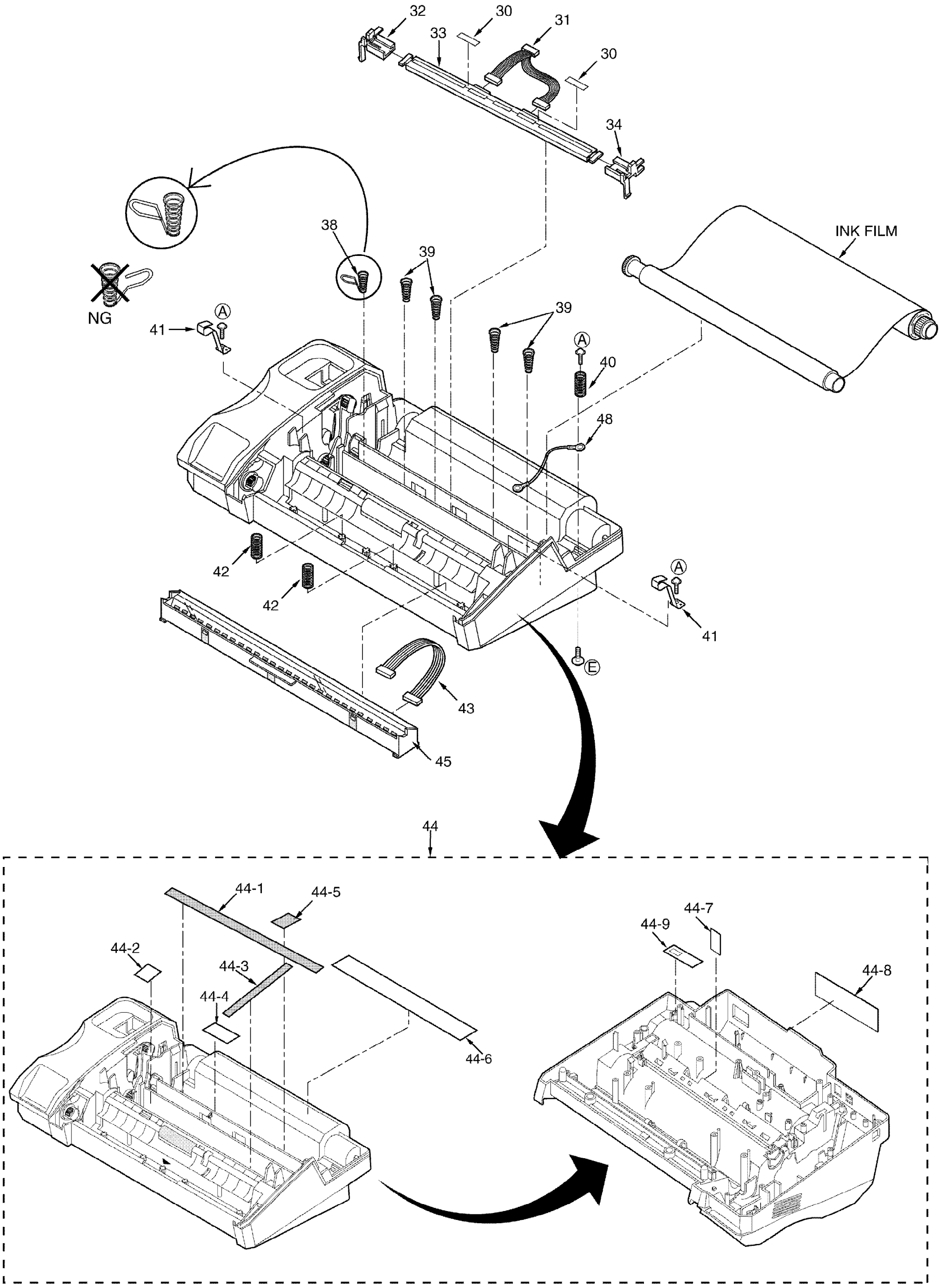
9. CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

9.1. OPERATION PANEL SECTION


1
3
4
10
5
102
6
7
Ⓐ
9
SW353
SW352
11
PCB3
12
14
15
3

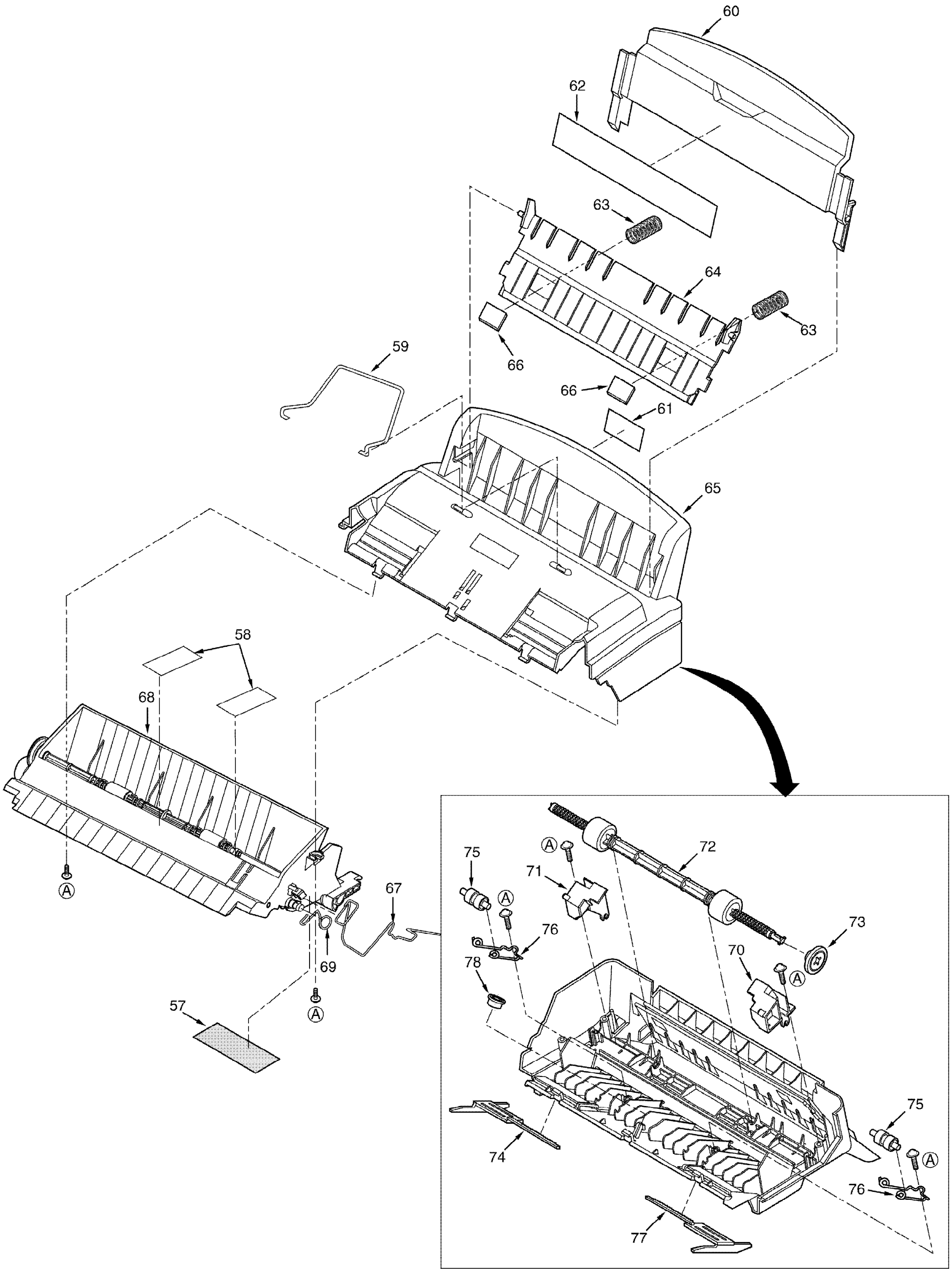
Note:
An assemble P.C.Board and two switches will be supplied as a kit. Please solder the switches on the P.C.Board before you replace.

9.2. UPPER CABINET SECTION

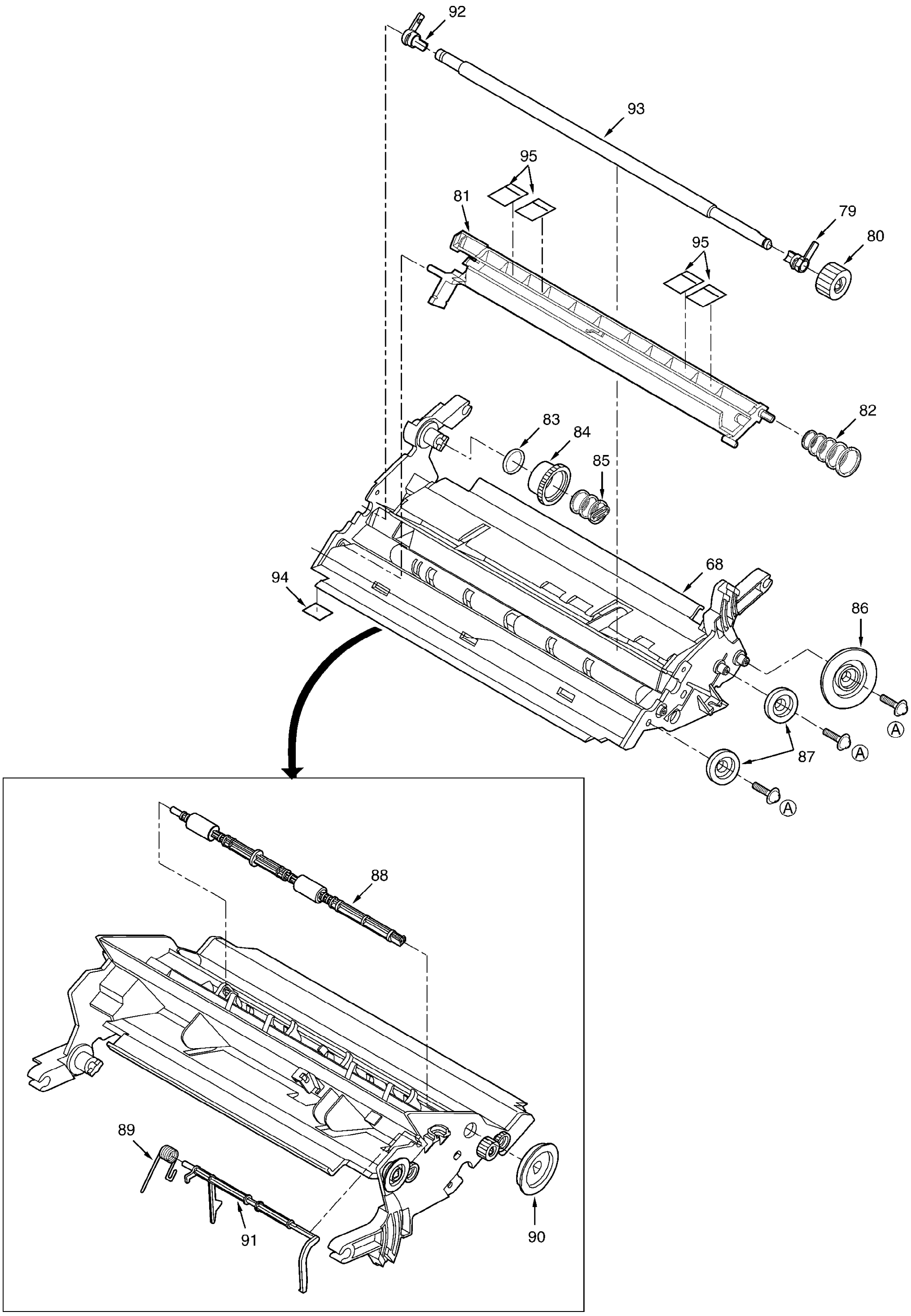

32
30
33
31
30
34
INK FILM
38
39
NG
41
Ⓐ
39
Ⓐ
40
48
42
42
Ⓐ
41
Ⓔ
43
45
44
44-1
44-5
44-2
44-3
44-4
44-6
44-7
44-9
44-8

9.2.1. BACK COVER SECTION

9.2.1.1. BACK COVER 1


60
62
63
64
63
66
66
61
59
65
58
68
Ⓐ
67
69
Ⓐ
57
72
75
Ⓐ
71
Ⓐ
76
73
70
78
Ⓐ
75
Ⓐ
74
76
77

9.2.1.2. BACK COVER 2


92
93
95
81
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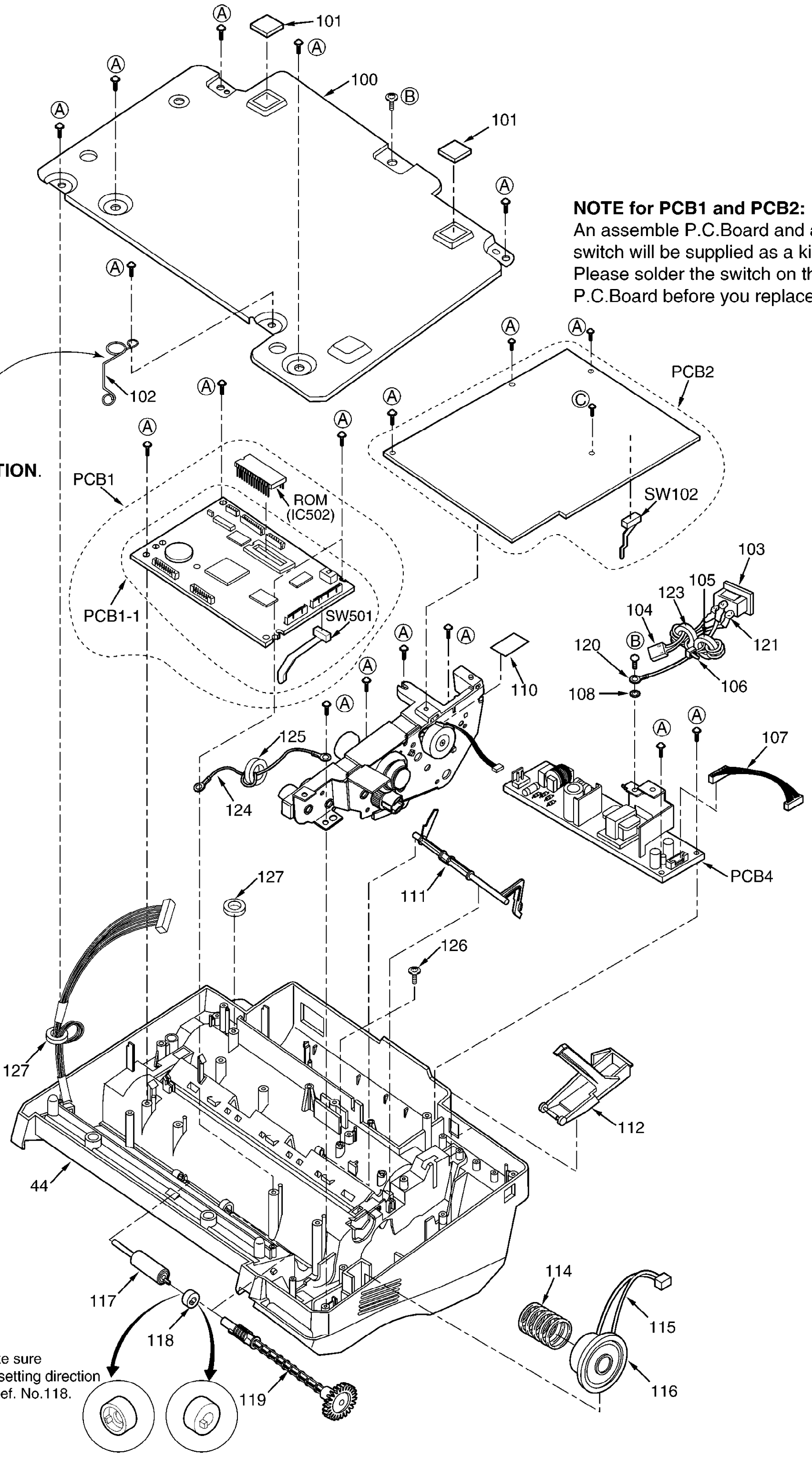
80
95
82
83
84
85
68
94
86
Ⓐ
Ⓐ
87
Ⓐ
88
89
91
90

9.3. LOWER/P.C.B. SECTION


Ⓐ
101
100
Ⓑ
102
PCB2
Ⓒ
SW102
PCB1
ROM
(IC502)
PCB1-1
SW501
103
105
123
104
121
120
106
108
110
107
125
124
PCB4
111
127
126
112
44
117
118
119
114
115
116

NOTE for PCB1 and PCB2:
An assemble P.C.Board and a switch will be supplied as a kit. Please solder the switch on the P.C.Board before you replace.

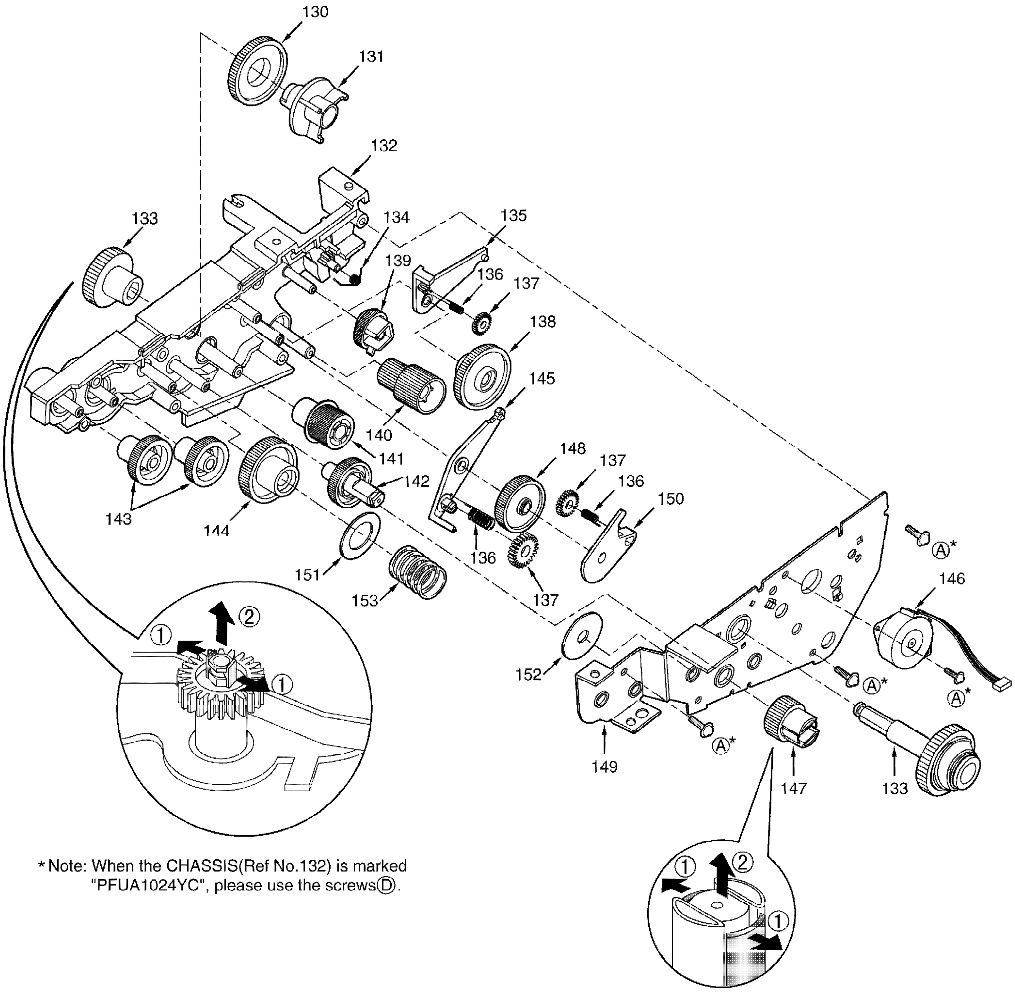
Refer to **9.1. OPERATION PANEL SECTION**.

Make sure the setting direction of Ref. No.118.

CROSS REFERENCE:

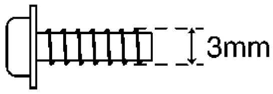
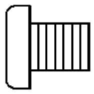
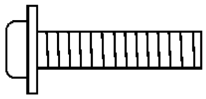
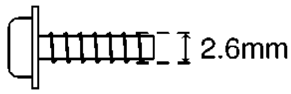
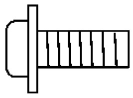
OPERATION PANEL SECTION**()**

9.4. MOTOR SECTION

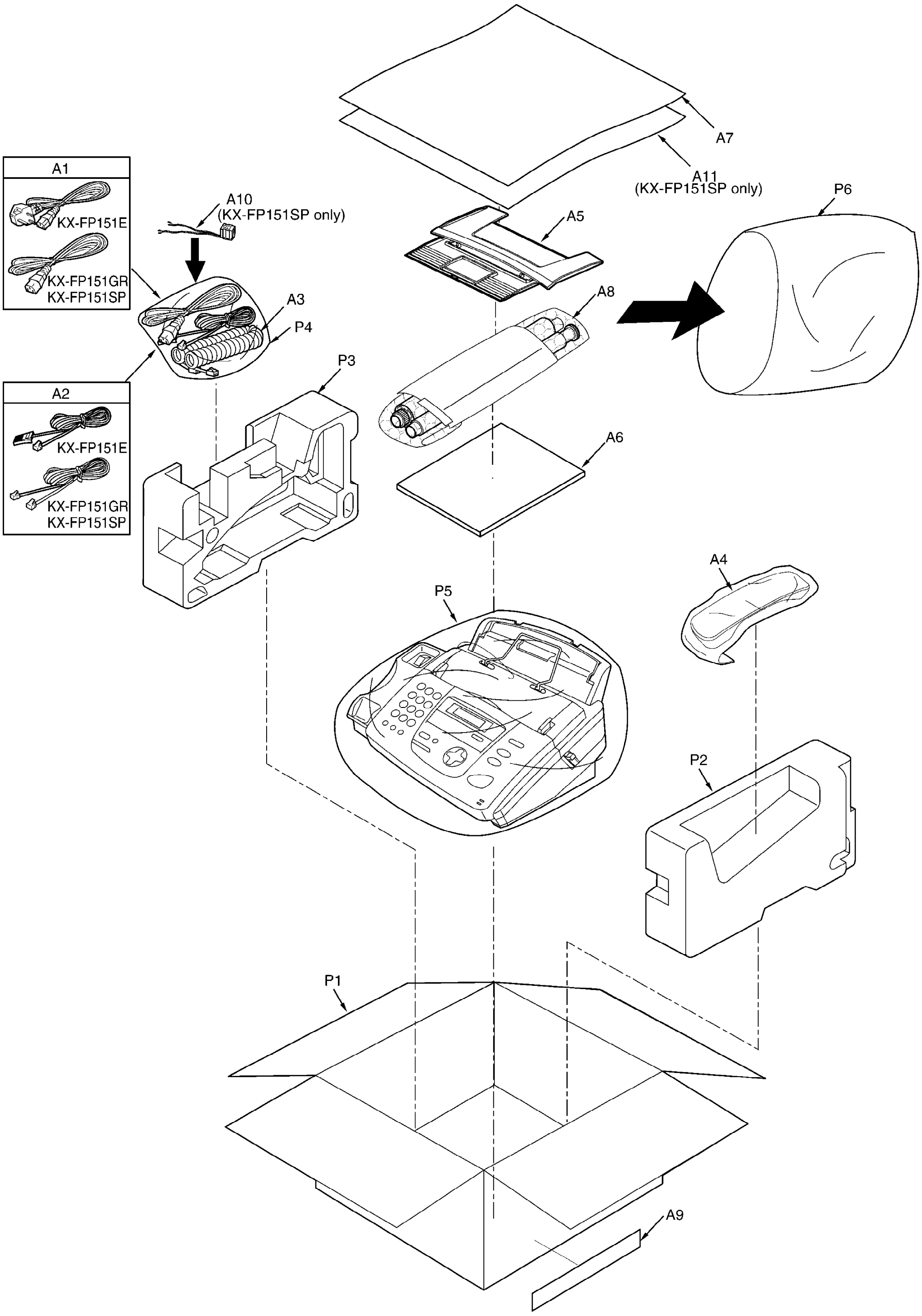

130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
136
137
136
137
133
Ⓐ*
Ⓐ*
Ⓐ*
Ⓐ*
①
②
①
①
②
①

*Note: When the CHASSIS(Ref No.132) is marked "PFUA1024YC", please use the screwsⒹ.

9.5. ACTUAL SIZE OF SCREWS AND WASHER

	Part No.	Illustration
Ⓐ	XTW3+S10P	
Ⓑ	XSB4+6	
Ⓒ	XTW3+U14L	
Ⓓ	XTW26+10P	
Ⓔ	XTW3+U8L	

10. ACCESSORIES AND PACKING MATERIALS


A7
A11
(KX-FP151SP only)
P6
A1
KX-FP151E
KX-FP151GR
KX-FP151SP
A10
(KX-FP151SP only)
A5
A8
A3
P4
P3
A2
KX-FP151E
KX-FP151GR
KX-FP151SP
A6
A4
P5
P2
P1
A9

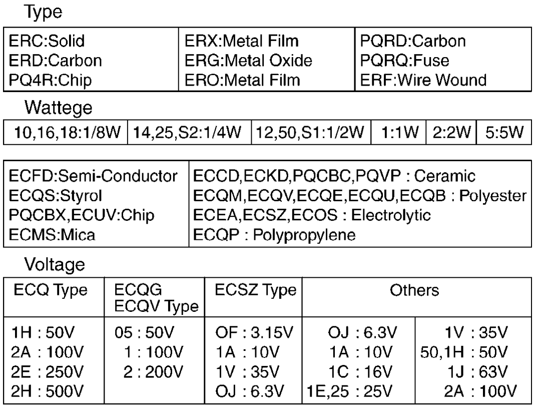
11. REPLACEMENT PARTS LIST

Notes:

1. **The marking (RTL) indicates that the Retention Time is limited for this item.**
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The

retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
After the end of this period, the assembly will no longer be available.

2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.
4. RESISTORS & CAPACITORS
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   *Type & Wattage of Resistor



Type

ERC:Solid	ERX:Metal Film	PQRD:Carbon
ERD:Carbon	ERG:Metal Oxide	PQRQ:Fuse
PQ4R:Chip	ERO:Metal Film	ERF:Wire Wound

Wattege

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W

ECFD:Semi-Conductor	ECCD,ECKD,PQCBC,PQVP : Ceramic
ECQS:Styrol	ECQM,ECQV,ECQE,ECQU,ECQB : Polyester
PQCBX,ECUV:Chip	ECEA,ECSZ,ECOS : Electrolytic
ECMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H : 50V	05 : 50V	OF : 3.15V	OJ : 6.3V	1V : 35V
2A : 100V	1 : 100V	1A : 10V	1A : 10V	50,1H : 50V
2E : 250V	2 : 200V	1V : 35V	1C : 16V	1J : 63V
2H : 500V		OJ : 6.3V	1E,25 : 25V	2A : 100V

11.1. CABINET AND ELECTRICAL PARTS

11.1.1. OPERATION PANEL SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
1	PFGP1197V	PANEL, LCD (for KX-FP151E)	
	PFGP1197Z	PANEL, LCD (for KX-FP151GR, KX-FP151SP)	
2	Not Used		
3	PFGG1175U2	GRILLE, OPERATION PANEL (for KX-FP151E)	
	PFGG1175Z1	GRILLE, OPERATION PANEL (for KX-FP151GR)	
	PFGG1175X1	GRILLE, OPERATION PANEL (for KX-FP151SP)	
4	PFDN1040Z	ROLLER, DOCUMENT EXIT	
5	PFHG1075Z	SPACER, DOCUMENT SEPARATION	
6	PFDG1148Z	GEAR, DOCUMENT EXIT ROLLER	
7	PFUS1229Z	SPRING, DOCUMENT SEP	
8	Not Used		
9	PFUV1039Z	COVER, OPERATION PANEL	
10	PFHX1373Z	INSULATOR, SEPATION RUBBER	
11	PFJS08Q35Z	CONNECTOR, 8P	
12	PFBX1135Y2	BUTTON, DIALER (for KX-FP151E)	
	PFBX1135Y1	BUTTON, DIALER (for KX-FP151GR, KX-FP151SP)	
13	Not Used		
14	PFBX1136Z2	BUTTON, DIALER (for KX-FP151E)	
	PFBX1136Z1	BUTTON, DIALER (for KX-FP151GR, KX-FP151SP)	
15	PFBC1076Z1	BUTTON, START	

11.1.2. UPPER CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
30	PFHX1350Z	SPACER, THERMAL HEAD	
31	PFJS11Q69Z	CONNECTOR, 11P	
32	PFHR1189Y	GUIDE, THERMAL HEAD (LEFT)	
33	PFJHS026Z	PRINTER UNIT, THERMAL HEAD	
34	PFHR1190Y	GUIDE, THERMAL HEAD (RIGHT)	
35	Not Used		
36	Not Used		
37	Not Used		
38	PFUS1335Z	SPRING, HEAD A	
39	PFUS1235Z	SPRING, THERMAL HEAD	
40	PFUS1254Z	SPRING, POP UP	
41	PFUS1236Z	SPRING, OPERATION PANEL LOCK	
42	PFUS1233Z	SPRING, CIS	
43	PFJS10Q72Z	CONNECTOR, 10P	
44	PFYMFP151E	CABINET, MAIN ASSY (for KX-FP151E)	
	PFYMFP151GR	CABINET, MAIN ASSY (for KX-FP151GR, KX-FP151SP)	
44-1	PFHX1462Z	INSULATOR, STATIC ELEC.(RIGHT)	
44-2	PFQT1666Z	LABEL, BLUE GEAR	
44-3	PFHX1344Z	INSULATOR, STATIC ELEC./D	
44-4	PFHX1537Z	SHEET, RIBBON GUIDE	

Ref. No.	Part No.	Part Name & Description	Remarks
44-5	PFHX1491Z	SPACER, JOINT	
44-6	PFQT1864Y	LABEL, INK FILM	
44-7	PFHX1382Z	SPACER, SENSOR	
44-8	PFQT1250Z	LABEL, CAUTION	
44-9	PFHX1546Z	SPACER, STATIC ELEC./M	
45	PF0U1022Y	PHOTO ELECTRIC TRANSDUCER, IMAGE SENSOR(CIS)	
46	Not Used		
47	Not Used		
48	WLL20YB09M3M	LEAD WIRE, EARTH	
49	Not Used		

11.1.3. BACK COVER SECTION -1

Ref. No.	Part No.	Part Name & Description	Remarks
57	PFHX1547Z	INSULATOR, STATIC ELEC.	
58	PFHX1513Z	SPACER, SHEET	
59	PFUS1385Z	SPRING, SUPPORT RECORDING PAPER	
60	PFDE1126Z2	LEVER, CASSETTE (for KX-FP151E)	
	PFDE1126Z1	LEVER, CASSETTE (for KX-FP151GR, KX-FP151SP)	
61	PFGT1980Z-SV	NAME PLATE (for KX-FP151E)	
	PFGT1928Z-SV	NAME PLATE (for KX-FP151GR)	
	PFGT1930Z-SV	NAME PLATE (for KX-FP151SP)	
62	PFQT1642B	LABEL, PAPER SET (for KX-FP151E)	
	PFQT1642D	LABEL, PAPER SET (for KX-FP151GR, KX-FP151SP)	
63	PFUS1238Z	SPRING, PICKUP	
64	PFKS1039Z	TRAY, CASSETE	
65	PFKV1044W2	COVER, UPPER TURN (for KX-FP151E)	
	PFKV1044W1	COVER, UPPER TURN (for KX-FP151GR, KX-FP151SP)	
66	PFHG1088Z	RUBBER, PAPER SEPARATION	
67	PFUS1386Z	SPRING, EARTH LEVER	
68	PFUA1035Z	CHASSIS, UPPER TURN	
69	PFUS1387Z	SPRING, EARTH	
70	PFHR1220Z	GUIDE, CORNER (LEFT)	
71	PFHR1221Z	GUIDE, CORNER (RIGHT)	
72	PFDN1042Z	ROLLER, PICKUP	
73	PFDG1163Z	GEAR, PICKUP ROLLER	
74	PFKR1017Z2	GUIDE, DOCUMENT (RIGHT) (for KX-FP151E)	
	PFKR1017Z1	GUIDE, DOCUMENT (RIGHT) (for KX-FP151GR, KX-FP151SP)	
75	PFDR1012Z	ROLLER, SUPPORT	
76	PFUS1234Z	SPRING, EXIT. SUB ROLLER	
77	PFKR1016Z2	GUIDE, DOCUMENT (LEFT) (for KX-FP151E)	
	PFKR1016Z1	GUIDE, DOCUMENT (LEFT) (for KX-FP151GR, KX-FP151SP)	
78	PFDG1161Z	GEAR, DOCUMENT GUIDE	

11.1.4. BACK COVER SECTION-2

Ref. No.	Part No.	Part Name & Description	Remarks
79	PFDJ1030Z	SPACER, PLATEN (RIGHT)	
80	PFDG1165Y	GEAR, PLATE	
81	PFDE1130X2	LEVER, LOCK	
82	PFUS1258Z	SPRING, LOCK LEVER	
83	PFHS1029Z	COVER, BACK TENSION SHEET	
84	PFDG1160Z	GEAR, BACK TENSION	
85	PFUS1232Z	SPRING, BACK TENSION	
86	PFDG1164Z	GEAR, PICKUP IDLER	
87	PFDG1166Z	GEAR, PLATEN IDLER	
88	PFDN1041Z	ROLLER, EXIT	
89	PFUS1237Z	SPRING, PAPER TOP	
90	PFDG1162Z	GEAR, EXIT ROLLER	
91	PFDE1128Y	LEVER, PAPER TOP SENSOR	
92	PFDJ1029Z	SPACER, PLATEN (LEFT)	
93	PFDN1043Z	ROLLER, PLATEN	
94	PFQT1817Z	LABEL, OPEN	
95	PFHX1500Z	SPACER, PAPER EXT	

11.1.5. LOWER CABINET / P.C.B.SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
100	PFMD1044Z	FRAME, BOTTOM	
101	PFHG1050Z	RUBBER, LEG	
102	PFUS1255Y	SPRING, EARTH	
103	PFJP03S04Z	CONNECTOR, 3P	⚠
104	PFJS02R19Y	CONNECTOR, 2P	
105	PQLB1E1	INSULATOR, FERRITE CORE	S
106	PQHR945Z	BAND, LEAD BINDER	
107	PFJS07Q67Z	CONNECTOR, 7P	
108	XWC4B	WASHER	
109	Not Used		
110	PFHX1350Z	SPACER, SHEET HEAD	
111	PFDE1161Z	LEVER, PAPER TOP SENSOR	
112	PFBH1014Z2	BUTTON, HOOK (for KX-FP151E)	
	PFBH1014Z1	BUTTON, HOOK (for KX-FP151GR, KX-FP151SP)	
113	Not Used		
114	PFUS1239Z	SPRING, SPEAKER	
115	PFJS02R60Z	CONNECTOR, 2P	
116	PFAS50P006Z	SPEAKER	
117	PFDR1014Z	ROLLER, DOCUMENT SEPARATION	
118	PFDE1133Z	SPACER, DELAY	
119	PFDF1050Z	SHAFT, DOCUMENT SEPARATION	
120	WLR18YK26CM4	LEAD, EARTH	
121	PQMX10010Z	COVER, TUBE	
122	Not Used		
123	KR06TT251508	FERRITE CORE	
124	BB17M3M3	LEAD WIRE	
125	PQLB1E1	FERRITE CORE	
126	PJHE5065Z	SCREW	
127	PQLB1E1	FERRITE CORE	

11.1.6. MOTOR SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
130	PFDG1155Z	GEAR, E	
131	PFHR1186Z	SPACER, SUPPORT BASE	
132	PFZMFM189E	CHASSIS KIT, GEAR BASE	
133	PFDX1022Z	GEAR, TORQUE LIMITER ASS'Y	
134	PFUS1230Z	SPRING, CAM	
135	PFHR1184Z	ARM, J	
136	PFUS1231Y	SPRING, GEAR I	
137	PFDG1159Z	GEAR, I	
138	PFDG1149Z	GEAR, A	
139	PFDG1152Z	GEAR, CAM	
140	PFDG1158Z	GEAR, H	
141	PFDG1151Z	GEAR, C	
142	PFDG1153Z	GEAR, D1	
143	PFDG1157Z	GEAR, G	
144	PFDG1156Z	GEAR, F	
145	PFHR1183Z	ARM, I	
146	PFJQ35S1S15D	DC MOTOR	S
147	PFDG1154Z	GEAR, D2	
148	PFDG1150Z	GEAR, B	
149	PFMD1043Z	FRAME, GEAR BASE COVER	
150	PFHR1185Z	ARM, V	
151	PFHX1532Z	COVER, GEAR SHEET	
152	PFHX1533Z	COVER, PLATE SHEET	
153	PFUS1382Z	SPRING, GEAR	

11.1.7. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10039Z	POWER CORD (for KX-FP151E)	⚠
	PQJA10038Y	POWER CORD (for KX-FP151GR, KX-FP151SP)	⚠
A2	PQJA87S	CORD, TELEPHONE (for KX-FP151E)	
	PQJA10075Z	CORD, TELEPHONE (for KX-FP151GR, KX-FP151SP)	
A3	PFJA1029Y	CORD, HANDSET (for KX-FP151E)	
	PFJA1029Z	CORD, HANDSET (for KX-FP151GR, KX-FP151SP)	
A4	PFJXE1001Z	HANDSET (for KX-FP151E)	
	PFJXE1005Z	HANDSET (for KX-FP151GR, KX-FP151SP)	
A5	PFKS1043Z2	TRAY, PAPER (for KX-FP151E)	S
	PFKS1043Z1	TRAY, PAPER (for KX-FP151GR, KX-FP151SP)	S
A6	PFQX1628Z	INSTRUCTION BOOK (for KX-FP151E)	
	PFQX1632Z	INSTRUCTION BOOK (for KX-FP151GR)	
	PFQX1633Z	INSTRUCTION BOOK (for KX-FP151SP)	
A7	PFQW1682Z	INSTRUCTION BOOK (QUICK START SHEET) (for KX-FP151E)	
	PFQW1662Z	INSTRUCTION BOOK (QUICK START SHEET) (for KX-FP151GR)	
	PFQW1663Z	INSTRUCTION BOOK (QUICK START SHEET in SPANISH AND PORTUGUESE) (for KX-FP151SP)	

Ref. No.	Part No.	Part Name & Description	Remarks
A8	PFPE1075Z	ACCESSORY PARTS, INK RIBBON(10M)	
A9	PFQA1189Z	LABEL, MADE IN SLOBAKIA	
A10	PQJJ1TA8Z	JACK SOCKET, TEL PLUG (KX-FP151SP only)	
A11	PFQW1713Z	INSTRUCTION BOOK (QUICK START SHEET in ENGLISH) (KX-FP151SP only)	
P1	PFPK2028Z-SV	GIFT BOX (for KX-FP151E)	
	PFPK2015Z-SV	GIFT BOX (for KX-FP151GR)	
	PFPK2017Z-SV	GIFT BOX (for KX-FP151SP)	
P2	PFPN1256Z	CUSHION, RIGHT	
P3	PFPN1255Z	CUSHION, LEFT	
P4	XZB20X35A04	PROTECTION COVER	
P5	PFPH1030Z	PACKING SHEET	
P6	XZB32X45A04	PROTECTION COVER	

11.2. DIGITAL BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PFWP1FP151E	DIGITAL BOARD ASS'Y (RTL) (for KX-FP151E)	
	PFWP1FP151GR	DIGITAL BOARD ASS'Y (RTL) (for KX-FP151GR)	
	PFWP1FP151SP	DIGITAL BOARD ASS'Y (RTL) (for KX-FP151SP)	
PCB1-1	PFWP2FP151JT	DIGITAL BOARD ASS'Y (RTL) [without ROM]	
		(ICS)	
IC501	PFVIM66440M1	IC	S
IC502	PFWIFP151E	IC(ROM) (for KX-FP151E)	
	PFWIFP151GR	IC(ROM) (for KX-FP151GR)	
	PFWIFP151SP	IC(ROM) (for KX-FP151SP)	
IC503	PFVIMS5148EF	IC	S
IC504	PFVIM0525LFF	IC	
IC507	PFVIXCN4202N	IC	S
IC508	PFVIT2003APS	IC	S
IC514	AN6383SB	IC	
IC515	PFVIR676812	IC	
IC516	PQVIMM1385EN	IC	S
		(TRANSISTORS)	
IC506	PFVTSI4431DY	TRANSISTOR(SI)	S
Q501	2SB1322	TRANSISTOR(SI)	S
Q502	PQVTDTC114EU	TRANSISTOR(SI)	S
Q503	PQVTDTC114EU	TRANSISTOR(SI)	S
Q504	2SB709A	TRANSISTOR(SI)	
Q507	2SD1819A	TRANSISTOR(SI)	S
Q510	2SB1218A	TRANSISTOR(SI)	
Q512	PQVTDTC143E	TRANSISTOR(SI)	S
		(DIODES)	
D501	PFVDRMRLS245	DIODE(SI)	S
D502	MA7160	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D508	RLS71	DIODE(SI)	
DA501	MA141WK	DIODE(SI)	
DA502	MA143	DIODE(SI)	
		(BATTERY)	
BAT501	PFSU1004Z	LITHIUM BATTERY	S
		(COILS)	
L506	PQLQR1ET	COIL	S
L514	PQLQR2KA20T	COIL	S
L518	PQLQR2KA20T	COIL	S
L523	PQLQR2KB113T	COIL	S
L527	PQLQR2KB113T	COIL	S
L528	PQLQR1ET	COIL	S
L530	PQLQR2KB113T	COIL	S
L531	PQLQR2KB113T	COIL	S
L532	PQLQR2KB113T	COIL	S
L533	PQLQR2KA20T	COIL	S
L534	PQLQR2KA20T	COIL	S
L535	PQLQR2KA20T	COIL	S
L537	PQLQR2KB113T	COIL	S
L540	PQLQR2KB113T	COIL	S
L541	PQLQR2KB113T	COIL	S
LFT104	ELB3S402E	COIL	
R635	PQLQR2KB113T	COIL	S
R636	PQLQR2KB113T	COIL	S
R637	PQLQR2KB113T	COIL	S
R640	PQLQR2KA20T	COIL	S
R692	PQLQR2KA20T	COIL	S
R694	PQLQR2KA20T	COIL	S
R695	PQLQR2KA20T	COIL	S
R696	PQLQR2KB113T	COIL	S
R697	PQLQR2KA20T	COIL	S
		(COMPONENTS COMBINATIONS)	
RA501	EXB38V101JV	RESISTOR ARRAY	
RA502	EXB38V101JV	RESISTOR ARRAY	
RA503	EXB38V101JV	RESISTOR ARRAY	
RA504	EXB38V101JV	RESISTOR ARRAY	
RA505	EXB38V101JV	RESISTOR ARRAY	
RA506	EXB38V101JV	RESISTOR ARRAY	
		(CONNECTORS)	
CN501	PQJP17A19Z	CONNECTOR, 17PIN	S
CN502	PQJP5G30Z	CONNECTOR, 5PIN	S
CN503	PQJP10G30Z	CONNECTOR, 10PIN	S
CN504	PQJP11G30Z	CONNECTOR, 11PIN	S
CN505	PQJP11G100Z	CONNECTOR, 11PIN	
CN506	PQJP7G30Y	CONNECTOR, 7PIN	S
CN507	PQJP10A19Z	CONNECTOR, 10PIN	S
		(SWITCH)	
SW501	PFSH1A001Z	SWITCH, FILM COVER	

Ref. No.	Part No.	Part Name & Description	Remarks
		(CRYSTAL OSCILLATIONS)	
X501	PFVCCFS32Z	CRYSTAL OSCILLATOR	S
X502	PFVBKB240ZAT	CRYSTAL OSCILLATOR	S
X503	PFVC32256ZAT	CRYSTAL OSCILLATOR	S
		(FUSE)	
F501	PFRB001251KC	FUSE	S
F502	PFRB002122KZ	FUSE	S
		(PHOTO ELECTRIC TRANSDUCER)	
PS501	PFVISG257	PHOTO SENSOR	S
		(RESISTORS)	
C636	ERJ3GEY0R00	0	
L529	ERJ3GEY0R00	0	
L536	PQ4R18XJ220	22	S
R503	ERJ3GEY0R00	0	
R505	ERJ3GEYJ562	5.6k	
R506	ERJ3GEYJ472	4.7k	
R507	ERJ3GEY0R00	0	
R508	ERJ3GEY0R00	0	
R509	ERJ3GEYJ101	100	
R510	ERJ3GEY0R00	0	
R511	ERJ3GEY0R00	0	
R512	ERJ3GEYJ821	820	
R513	ERDS1VJ152	1.5k	S
R514	ERJ3GEYJ223	22k	
R515	ERJ3GEYJ823	82k	
R517	ERJ3GEY0R00	0	
R520	ERJ3GEYJ103	10k	
R522	ERJ3GEYJ472	4.7k	
R523	ERJ3GEYJ101	100	
R524	ERJ3GEYJ562	5.6k	
R525	ERJ3GEYJ563	56k	
R527	ERJ3GEYJ101	100	
R528	ERJ3GEYJ101	100	
R529	ERJ3GEYJ203	20k	
R530	ERJ3GEYJ101	100	
R533	ERJ3GEYJ102	1k	
R534	ERJ3GEYJ101	100	
R535	ERJ3GEY0R00	0	
R536	ERJ3GEY0R00	0	
R537	ERJ3GEY0R00	0	
R538	ERJ3GEY0R00	0	
R543	ERJ3GEYJ222	2.2k	
R545	ERJ3GEYJ471	470	
R546	ERJ3GEYJ472	4.7k	
R547	ERJ3EKF1101	1.1k	
R550	ERJ3GEY0R00	0	
R551	ERJ3GEYJ270	27	
R552	ERJ3GEY0R00	0	
R553	ERJ3GEYJ105	1M	
R556	ERJ3GEYJ103	10k	
R557	ERJ3GEYJ103	10k	

Ref. No.	Part No.	Part Name & Description	Remarks
R561	ERJ3GEYJ472	4.7k	
R564	ERJ3GEYJ103	10k	
R565	ERJ3GEYJ101	100	
R566	ERJ3GEYJ101	100	
R568	ERJ3GEYJ101	100	
R570	ERJ3GEYJ104	100k	
R572	ERJ3GEYJ823	82k	
R574	ERJ3GEYJ183	18k	
R575	ERJ3GEYJ333	33k	
R579	ERJ3GEYJ683	68k	
R580	ERJ3GEYJ563	56k	
R581	ERJ3GEYJ562	5.6k	
R589	ERJ3GEYJ472	4.7k	
R590	ERJ3GEYJ472	4.7k	
R594	ERJ3GEYJ103	10k	
R595	ERJ3GEYJ331	330	
R596	ERJ3GEYJ104	100k	
R598	ERJ3GEY0R00	0	
R601	ERJ3GEYJ103	10k	
R603	ERJ3GEYJ101	100	
R605	ERJ3GEYJ103	10k	
R606	ERJ3GEYJ101	100	
R607	ERJ3GEYJ472	4.7k	
R621	ERJ3GEYJ224	220k	
R622	ERJ3GEYJ224	220k	
R626	ERG2SJ391	390	
R628	ERJ3GEY0R00	0	
R630	ERJ3GEYJ274	270k	
R631	ERJ3GEYJ822	8.2k	
R633	ERJ3GEYJ183	18k	
R634	ERJ3GEYJ4R7	4.7	
R638	ERJ3GEY0R00	0	
R639	ERJ3GEY0R00	0	
R644	ERJ3GEYJ102	1k	
R645	ERJ3GEYJ103	10k	
R673	ERJ3GEYJ101	100	
R674	ERJ8GEYJ8R2	8.2	
R675	ERJ3GEYJ561	560	
R676	ERJ3GEYJ103	10k	
R677	ERJ3GEYJ222	2.2k	
R678	ERJ3GEYJ102	1k	
R679	ERJ3GEYJ272	2.7k	
R680	ERJ3GEYJ101	100	
R681	ERJ3GEYJ101	100	
R682	ERJ3GEY0R00	0	
R683	ERJ3GEY0R00	0	
R684	ERJ3GEY0R00	0	
R685	ERJ3GEY0R00	0	
R686	ERJ3GEY0R00	0	
R687	ERJ3GEYJ221	220	
R688	ERJ3GEYJ221	220	
R689	ERJ3GEYJ221	220	
R690	ERJ3GEYJ221	220	
R691	ERJ3GEYJ221	220	

Ref. No.	Part No.	Part Name & Description	Remarks
R693	ERJ3GEYJ221	220	
R698	ERJ3GEYJ221	220	
R699	ERJ3GEYJ221	220	
		(CAPACITORS)	
C504	PQCUV1E104MD	0.1	
C508	ECUV1H104ZFV	0.1	S
C509	ECEA1CK101	100	S
C510	ECUV1H561JCV	560P	
C512	ECUV1H104ZFV	0.1	S
C513	ECUV1H104ZFV	0.1	S
C514	ECUV1H104ZFV	0.1	S
C515	ECUV1H102KBV	0.001	S
C516	ECUV1H104ZFV	0.1	S
C517	ECUV1H104ZFV	0.1	S
C520	ECUV1H180JCV	18P	
C522	ECJ1VB1C104	0.1	
C523	ECUV1H120JCV	12P	S
C524	ECUV1H104ZFV	0.1	S
C525	ECUV1H104ZFV	0.1	S
C527	ECUV1H222KBV	0.0022	S
C528	ECJ1VB1C104	0.1	
C529	ECUV1H104ZFV	0.1	S
C530	ECUV1H104ZFV	0.1	S
C531	ECUV1H104ZFV	0.1	S
C533	ECUV1H104ZFV	0.1	S
C534	ECUV1H104ZFV	0.1	S
C536	ECUV1H104ZFV	0.1	S
C537	ECUV1H104ZFV	0.1	S
C538	ECUV1H104ZFV	0.1	S
C539	ECUV1H104ZFV	0.1	S
C540	ECUV1H104ZFV	0.1	S
C543	ECUV1H104ZFV	0.1	S
C544	ECUV1H104ZFV	0.1	S
C546	ECUV1H104ZFV	0.1	S
C547	ECUV1H100JCV	10P	S
C548	ECUV1H120JCV	12P	S
C549	ECUV1H102KBV	0.001	S
C550	ECUV1H330JCV	33P	S
C553	ECUV1H104ZFV	0.1	S
C554	ECUV1H102KBV	0.001	S
C565	ECUV1H104ZFV	0.1	S
C569	ECEA0JKA221	220	
C570	ECJ1VB1C104	0.1	
C581	ECUV1H181JCV	180P	S
C582	ECUV1H471JCV	470P	
C584	ECJ1VB1C104	0.1	
C586	ECJ1VB1C104	0.1	
C587	ECUV1C473KBV	0.047	S
C590	ECUV1H561JCV	560P	
C591	ECUV1H821JCV	820P	
C593	ECUV1H104ZFV	0.1	S
C596	ECEA0JKA221	220	
C603	ECUV1H104ZFV	0.1	S

Ref. No.	Part No.	Part Name & Description	Remarks
C612	ECUV1H102KBV	0.001	S
C615	ECJ1VB1C104	0.1	
C622	ECUV1H103KBV	0.01	S
C630	ECJ1VB1C104	0.1	
C640	ECUV1H104ZFV	0.1	S
C641	ECUV1H104ZFV	0.1	S
C643	ECUV1H681JCV	680P	
C644	ECUV1H681JCV	680P	
C645	ECUV1H681JCV	680P	
C646	ECUV1H101JCV	100P	S
C647	ECUV1H100JCV	10P	S
C648	ECUV1H100JCV	10P	S
C652	ECUV1H100JCV	10P	S
C653	ECUV1H100JCV	10P	S
C654	ECUV1H104ZFV	0.1	S
C656	ECUV1H104ZFV	0.1	S
C657	ECUV1H103KBV	0.01	S
C658	ECUV1H104ZFV	0.1	S
C659	ECUV1H104ZFV	0.1	S
C660	ECEA0JKA221	220	
C661	ECEA1CK101	100	S
C662	ECUV1H104ZFV	0.1	S
C663	ECJ1VB1C104	0.1	
C664	ECUV1H682KBV	0.0068	S
C665	ECJ1VB1C104	0.1	
C666	ECUV1H104ZFV	0.1	S
C667	ECUV1H104ZFV	0.1	S
C668	ECEA1CKS100	10	S
C669	ECEA1CKS100	10	S
C670	ECUV1H104ZFV	0.1	S
C671	ECUV1H104ZFV	0.1	S
C673	ECUV1H104ZFV	0.1	S
C674	ECUV1H101JCV	100P	S
C679	ECUV1H104ZFV	0.1	S

11.3. ANALOGUE BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PFWP4FP151E	ANALOGUE BOARD ASS'Y (RTL)	⚠
		Refer to LOWER/P.C.B. SECTION().	
		(ICS)	
IC101	PFVIPC4082T2	IC	S
IC102	PQVIMC34119M	IC	S
IC106	PFVIPC4082T2	IC	S
IC107	AN6183SAE1	IC	S
		(TRANSISTORS)	
Q105	2SC2235	TRANSISTOR(SI)	S
Q107	2SD1819A	TRANSISTOR(SI)	S
Q108	PQVTDTC143E	TRANSISTOR(SI)	S
Q109	2SD1819A	TRANSISTOR(SI)	S
Q110	2SD1819A	TRANSISTOR(SI)	S
Q112	2SA1627	TRANSISTOR(SI)	S
Q115	PQVTDTC143E	TRANSISTOR(SI)	S
Q116	2SA1627	TRANSISTOR(SI)	S
Q117	2SD1819A	TRANSISTOR(SI)	S
Q124	2SD1819A	TRANSISTOR(SI)	S
		(DIODES)	
D102	MA4056	DIODE(SI)	
D107	MA4056	DIODE(SI)	
D108	MA4056	DIODE(SI)	
D109	1SS119	DIODE(SI)	S
D111	PQVDHZS2B1	DIODE(SI)	S
D117	1SS119	DIODE(SI)	S
D118	PFVDDGS1ZB60	DIODE(SI)	
D121	MA4056	DIODE(SI)	
D122	MA4056	DIODE(SI)	
D125	1SS119	DIODE(SI)	S
D126	1SS119	DIODE(SI)	S
		(COILS)	
FLT101	PFLE003	COIL	
FLT103	PFLE126	COIL	S
FLT105	PFLQZ004	COIL	S
FLT106	PFLQZ004	COIL	S
JJ262	PQLQR2KB20T	COIL	S
L103	PQLQR2KA213	COIL	S
L104	PQLQR2KA213	COIL	S
L105	PQLQR2KA213	COIL	S
L106	PQLQR2KA213	COIL	S
L108	PQLQR2KB113T	COIL	S
L109	PQLQR2KB113T	COIL	S
L110	PQLQR2KB113T	COIL	S
L111	PQLQR2KB113T	COIL	S
L116	PQLQR2KB113T	COIL	S
L124	PQLQR2KB113T	COIL	S
L126	PQLQR2KB20T	COIL	S
L127	PQLQR2KB20T	COIL	S
L128	PQLQR2KB20T	COIL	S
L129	PQLQR2KB20T	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L130	PQLQR2KB113T	COIL	S
R108	PQLQR2KB113T	COIL	S
R187	PQLQR2KA113	COIL	S
		(CONNECTORS)	
CN101	PQJS17A10Z	CONNECTOR	S
CN105	PQJP02G100Z	CONNECTOR	
CN106	PQJS10A10Z	CONNECTOR	S
		(JACKS)	
CN102	PQJJ1TC5Z	JACK	S
CN103	PFJJ1T007Z	JACK	S
CN104	PQJJ1TB18Z	JACK	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC102	PQVITLP620K	PHOTO COUPLER	S ⚠
PC105	PQVIPS2532-1	PHOTO COUPLER	S ⚠
PC106	PQVIPC817CD	PHOTO COUPLER	S ⚠
PC107	PQVIPC817CD	PHOTO COUPLER	S ⚠
		(SWITCHES)	
SW101	ESE14A211	PUSH SWITCH	
SW102	PFSH1A002Z	SWITCH, MOTOR POSITION	
		(VARISTORS)	
SA101	PFRZRA311P6T	VARISTOR(SURGE ABSORBER)	S
SA102	PFRZ001Z	VARISTOR(SURGE ABSORBER)	S ⚠
ZNR101	ERZVA7D151	VARISTOR	
		(RELAY)	
RL101	PFSL003Z	RELAY	S ⚠
		(TRANSFORMER)	
T101	PFLT8E003	TRANSFORMER	S ⚠
T102	PFLT8E004	TRANSFORMER	S ⚠
		(FUSE)	
F101	PQBA1N10NMAL	FUSE	S
		(COMPONENTS PARTS)	
L107	EXCELDR35	COMPONENTS PARTS	
		(CERAMIC FILTER)	
L125	PFVF2B272ST	CERAMIC FILTER	S
		(RESISTORS)	
C121	ERJ3GEYJ683	68k	
C122	ERJ3GEYJ683	68k	
J124	ERJ3GEY0R00	0	
J155	PQ4R10XJ000	0	S
JJ221	ERDS1TJ331	330	S
L117	ERJ3GEY0R00	0	

[illegible]	[illegible]	[illegible]	

Ref. No.	Part No.	Part Name & Description	Remarks
L118	ERJ3GEY0R00	0	
L119	ERJ3GEY0R00	0	
L120	ERJ3GEY0R00	0	
L121	ERJ3GEY0R00	0	
L122	ERJ3GEY0R00	0	
L123	ERJ3GEY0R00	0	
R112	ERJ3GEYJ433	43k	
R113	ERJ3GEYJ184	180k	
R114	ERJ3GEYJ184	180k	
R118	ERJ3GEY0R00	0	
R122	ERJ3GEYJ474	470k	
R125	ERJ3GEYJ561	560	
R128	ERJ3GEYJ331	330	
R131	ERJ3GEYJ101	100	
R134	ERJ3GEYJ332	3.3k	
R135	ERJ3GEYJ472	4.7k	
R136	ERJ3GEYJ182	1.8k	
R137	ERJ3GEYJ182	1.8k	
R138	ERJ3GEYJ332	3.3k	
R141	ERJ3GEYJ101	100	
R142	ERJ3GEYJ472	4.7k	
R143	ERJ3GEYJ103	10k	
R144	ERJ3GEYJ103	10k	
R146	ERDS1VJ000	0	S
R151	ERJ3GEYJ222	2.2k	
R153	ERJ3GEYJ222	2.2k	
R155	ERDS2TJ121	120	S
R156	ERJ3GEYJ123	12k	
R158	ERDS2TJ391	390	S
R159	ERJ3GEYJ103	10k	
R162	ERJ3GEYJ123	12k	
R164	ERJ3GEYJ153	15k	
R166	ERJ3GEYJ102	1k	
R167	ERJ3GEYJ333	33k	
R168	ERJ3GEYJ101	100	
R169	ERJ3GEYJ103	10k	
R171	ERJ3GEYJ561	560	
R173	ERDS2TJ120	12	S
R174	ERJ3GEYJ473	47k	
R175	ERJ3GEYJ154	150k	
R176	ERJ3GEYJ114	110k	
R178	ERG2SJ821	820	
R181	ERJ3GEYJ204	200k	
R185	PQ4R10XJ562	5.6k	S
R186	ERJ3GEYJ124	120k	
R189	ERDS2TJ472	4.7k	S
R191	ERJ3GEYJ102	1k	
R192	ERJ3GEYJ104	100k	
R193	ERJ3GEYJ123	12k	
R194	ERJ3GEYJ474	470k	
R195	PQLQR2KB113T	COIL	S
R196	ERJ3GEYJ103	10k	
R198	ERJ3GEYJ333	33k	
R201	ERJ3GEYJ224	220k	

Ref. No.	Part No.	Part Name & Description	Remarks
R202	ERDS1TJ223	22k	S
R203	ERJ3GEYJ623	62k	
R204	ERJ3GEYJ243	24k	
R205	ERJ3GEYJ224	220k	
R206	ERJ3GEYJ223	22k	
R207	ERJ3GEYJ243	24k	
R208	ERJ3GEYJ473	47k	
R209	ERJ3GEYJ101	100	
R210	ERJ3GEYJ331	330	
R212	ERJ3GEYJ331	330	
R213	ERJ3GEYJ182	1.8k	
R214	ERJ3GEYJ182	1.8k	
R215	ERDS1TJ183	18k	S
R216	ERJ3GEYJ123	12k	
R223	ERJ3GEY0R00	0	
R230	ERJ3GEYJ103	10k	
R233	ERJ3GEYJ103	10k	
		(CAPACITORS)	
C110	ECUV1C104KBV	0.1	
C113	ECUV1E225Z	2.2	
C116	ECUV1H121JCV	120	
C117	PQCUV1H104ZF	0.1	S
C119	ECUV1H121JCV	120	
C126	ECUV1H221JCV	220P	S
C129	ECUV1C104KBV	0.1	
C130	ECUV1C104KBV	0.1	
C133	PQCUV1C224KB	0.22	
C135	ECUV1H103KBV	0.01	S
C136	ECEA1HKS4R7	4.7	
C138	PQCUV1C334KB	0.33	
C139	ECEA0JKS101	100	
C141	ECJ2VB1C563K	0.056	
C142	PQCUV1C334KB	0.33	
C143	ECJ2VB1C563K	0.056	
C144	ECUV1H104ZFV	0.1	S
C145	ECEA0JKS101	100	
C146	ECUV1H103KBV	0.01	S
C147	ECUV1H104ZFV	0.1	S
C148	ECUV1C273KBV	0.027	S
C149	PQCUV1H104ZF	0.1	S
C150	ECEA1CKS101	100	
C153	ECEA1HKS2R2	2.2	
C155	PQCUV1H104ZF	0.1	S
C159	ECEA1CKS470	47	
C161	ECUV1H183KBV	0.018	
C162	ECUV1E333KBV	0.033	
C165	ECEA1HKS4R7	4.7	
C166	ECEA1HKS010	1	
C167	ECUV1H102KBV	0.001	S
C170	ECEA1HKS4R7	4.7	
C174	ECA1HM101B	100	
C176	ECUV1C104KBV	0.1	
C177	PQCUV1H332KB	0.0033	

Ref. No.	Part No.	Part Name & Description	Remarks
C179	ECKD2H681KB	680P	S
C180	ECKD2H681KB	680P	S
C181	PQCUV1C224ZF	0.22	
C182	ECEA0JU331	330	
C183	ECUV1C104KBV	0.1	
C184	ECUV1H103KBV	0.01	S
C185	ECUV1C563KBV	0.056	
C190	PQ4R10XJ000	0	S
C191	PQCUV1H104ZF	0.1	S
C193	ECUV1H121JCV	120P	
C194	ECUV1H471JCV	470P	
C195	ECUV1H121JCV	120P	
C197	ECUV1C104KBV	0.1	
C198	ECQE2E105KZ	1	S
C199	ECUV1C473KBV	0.047	S
C200	ECUV1C473KBV	0.047	S
C202	ECEA1CKS100	10	
C205	ECUV1H103KBV	0.01	S
C207	ECEA1CKS470	47	S
C210	ECUV1H103KBV	0.01	S
C212	ECUV1C475ZF	4.7	
C214	ECUV1H103KBV	0.01	S
C220	ECUV1H100JCV	10P	S
C222	PQCUV1H104ZF	0.1	S
C223	ECEA1HKS100	10	
C224	ECUV1H681JCV	680P	
C225	ECUV1H681JCV	680	
C226	ECUV1H100JCV	10P	S
C228	ECUV1H104ZFV	0.1	S
C229	ECUV1H104ZFV	0.1	S

11.4. OPERATION BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PFWP3FP151M	OPERATION BOARD ASS'Y (RTL)	
		Refer to OPERATION PANEL SECTION ().	
		(IC)	
IC301	MN7D032Z9J	IC	
		(CONNECTOR)	
CN301	PQJP8G43Z	CONNECTOR, 8P	S
		(SWITCHES)	
SW352	PFSH1A002Z	SWITCH, DOCUMENT SET	
SW353	PFSH1A002Z	SWITCH, DOCUMENT TOP	
		(LIQUID CRYSTAL DISPLAY)	
CN302	L5DAAFB00001	LIQUID CRYSTAL DISPLAY	
		(RESISTORS)	
R303	ERJ3GEYJ183	18k	
R305	ERJ3GEYJ222	2.2k	
R306	ERJ3GEYJ222	2.2k	
R314	ERJ3GEYJ472	4.7k	
R315	ERJ3GEYJ101	100	
R316	ERJ3GEYJ472	4.7k	
R317	ERJ3GEYJ101	100	
R318	ERJ3GEYJ4R7	4.7	
		(CAPACITORS)	
C302	ECUV1C104KBV	0.1	S
C303	ECEA0JKS101	100	
C304	ECUV1C104KBV	0.1	S
C305	ECUV1H101JCV	100P	S
C308	ECUV1H331JCV	330P	S
C309	ECUV1H331JCV	330P	S
C310	ECUV1C104KBV	0.1	S
C311	ECUV1C104KBV	0.1	S
C314	ECUV1C104KBV	0.1	S
C316	ECUV1H103KBV	0.01	S
C317	ECUV1H103KBV	0.01	S
		(SWITCHES)	
SW301	PQSH1A105Z	PUSH SWITCH	S
SW302	PQSH1A105Z	PUSH SWITCH	S
SW303	PQSH1A105Z	PUSH SWITCH	S
SW304	PQSH1A105Z	PUSH SWITCH	S
SW305	PQSH1A105Z	PUSH SWITCH	S
SW306	PQSH1A105Z	PUSH SWITCH	S
SW307	PQSH1A105Z	PUSH SWITCH	S
SW308	PQSH1A105Z	PUSH SWITCH	S
SW309	PQSH1A105Z	PUSH SWITCH	S

Ref. No.	Part No.	Part Name & Description	Remarks
SW310	PQSH1A105Z	PUSH SWITCH	S
SW311	PQSH1A105Z	PUSH SWITCH	S
SW312	PQSH1A105Z	PUSH SWITCH	S
SW313	PQSH1A105Z	PUSH SWITCH	S
SW314	PQSH1A105Z	PUSH SWITCH	S
SW315	PQSH1A105Z	PUSH SWITCH	S
SW316	PQSH1A105Z	PUSH SWITCH	S
SW317	PQSH1A105Z	PUSH SWITCH	S
SW318	PQSH1A105Z	PUSH SWITCH	S
SW319	PQSH1A105Z	PUSH SWITCH	S
SW320	PQSH1A105Z	PUSH SWITCH	S
SW321	PQSH1A105Z	PUSH SWITCH	S
SW322	PQSH1A105Z	PUSH SWITCH	S
SW323	PQSH1A105Z	PUSH SWITCH	S
SW324	PQSH1A105Z	PUSH SWITCH	S
SW326	PQSH1A105Z	PUSH SWITCH	S
SW327	PQSH1A105Z	PUSH SWITCH	S
SW328	PQSH1A105Z	PUSH SWITCH	S

11.5. POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB4	PFLP1282EZL	POWER SUPPLY BOARD ASS'Y (RTL)	⚠
		(ICS)	
IC101	PFVIFA5317P	IC	
IC201	AN1431T	IC	
IC202	PFVITA7805F	IC	S
		(TRANSISTORS)	
Q101	2SK2651	TRANSISTOR(SI)	⚠
		(DIODES)	
D101	PFVD1N4005	DIODE(SI)	⚠ S
D102	PFVD1N4005	DIODE(SI)	⚠ S
D103	PFVD1N4005	DIODE(SI)	⚠ S
D104	PFVD1N4005	DIODE(SI)	⚠ S
D105	PFVDEG01C	DIODE(SI)	S
D106	MA165	DIODE(SI)	
D107	MA4220	DIODE(SI)	
D108	PQVDERA1802	DIODE(SI)	S
D201	PFVDSF5LC20U	DIODE(SI)	S
D202	PFVDD1NL20U	DIODE(SI)	S
		(COIL)	
L101	ELF15N006A	COIL	⚠
		(COMPONENTS PARTS)	
L103	EXCELDR35	COMPONENTS PARTS	
		(CONNECTORS)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN31	PQJP2D98Z	CONNECTOR, 2 PIN	⚠
CN301	PQJP7G30Z	CONNECTOR, 7 PIN	⚠
		(FUSE)	
F101	PQBA2C31TRLW	FUSE	⚠ S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	PFVIPC123	PHOTO COUPLER	⚠ S
		(THERMISTOR)	
TH101	PFRT57235S80	THERMISTOR	S
		(TRANSFORMER)	
T101	PFLTSRW292ED	TRANSFORMER	⚠ S
		(VARIABLE RESISTOR)	
VR201	EVNDJAA03B53	VARIABLE RESISTOR	
		(VARISTOR)	
ZNR101	ERZV10DK751U	VARISTOR	⚠
		(RESISTORS)	
R101	ERDS1J105	1M	⚠
R102	ERDS2TJ394	390k	
R103	ERDS2TJ394	390k	
R104	ERG2SJ304	300k	
R105	ERX2SJR22	0.22	
R106	ERG2SJ470	47	
R107	ERG2SJ304	300k	
R108	ERDS2FJ150	15	
R109	ERDS2TJ100	10	
R121	PQ4R10XJ103	10k	S
R122	PQ4R10XJ271	270	
R124	PQ4R10XJ181	180	S
R125	PQ4R10XJ103	10k	S
R126	PQ4R10XJ562	5.6k	S
R127	PQ4R10XJ182	1.8k	S
R128	PQ4R10XJ101	100	S
R136	PQ4R10XJ104	100k	S
R137	PQ4R10XJ104	100k	S
R202	ERG2SJ152	1.5k	
R203	ERDS2FJ470	47	
R221	PQ4R10XJ222	2.2k	S
R222	PQ4R10XJ222	2.2k	S
R223	PQ4R10XJ101	100	S
R224	PQ4R10XJ273	27k	S
R225	PQ4R10XJ332	3.3k	S
		(CAPACITORS)	
C101	ECQU2A224MG	0.22	⚠
C102	ECQU2A104MG	0.1	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
C103	PFKDE2GA102K	0.001	S
C105	PFKDE2GA222M	0.0022	⚠
C106	PFCEA400SX56	56	S
C108	ECKD3A102KBP	0.001	
C109	ECA1VHG470	47	
C110	PFKDD2GA222M	0.0022	S
C119	ECKD3A470KBP	47P	S
C121	ECUV1H472KBN	0.0047	
C122	ECUV1C224KBX	0.22	
C123	ECUV1H561KBN	560P	
C124	ECUV1E104KBX	0.1	S
C201	PFCEA35F471	470	S
C202	ECKD3A102KBP	0.001	
C203	PFCEA16A470	470	S
C204	PFCEA35A47M	47	S
C205	PFCEA50A47M	0.47	S
C206	ECKD3A102KBP	0.001	
C221	ECUV1E104KBX	0.1	

11.6. FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PQZZ2K12Z	CONNECTOR, 2P	
EC2	PFZZ10K1Z	CONNECTOR, 10P	
EC3	PFZZ17K2Z	CONNECTOR, 17P	
EC4	PQZZ7K5Z	CONNECTOR, 7P	
EC5	PFZZ11K13Z	CONNECTOR, 11P	
EC6	PFZZ5K13Z	CONNECTOR, 5P	
EC7	PQZZ11K4Z	CONNECTOR, 11P	
EC8	PQZZ2K13Z	CONNECTOR, 2P	
EC9	PFZZ10K3Z	CONNECTOR, 10P	
	KM79811245C0	BASIC FACSIMILE TECHNIQUE	
		(for training service technicians)	

Note:

Tools and Extension Cords are useful for servicing. (They make servicing easy.)

12. PRINTED CIRCUIT BOARD

12.1. DIGITAL BOARD: BOTTOM VIEW

12.2. DIGITAL BOARD: COMPONENT VIEW

12.3. ANALOGUE BOARD: BOTTOM VIEW

12.4. ANALOGUE BOARD: COMPONENT VIEW

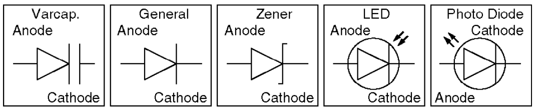
12.5. OPERATION BOARD

12.6. POWER SUPPLY BOARD

13. FOR THE SCHEMATIC DIAGRAMS

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.
3.


Varcap.
Anode
Cathode
General
Anode
Cathode
Zener
Anode
Cathode
LED
Anode
Cathode
Photo Diode
Cathode
Anode

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

13.1. MEMO

14. SCHEMATIC DIAGRAM

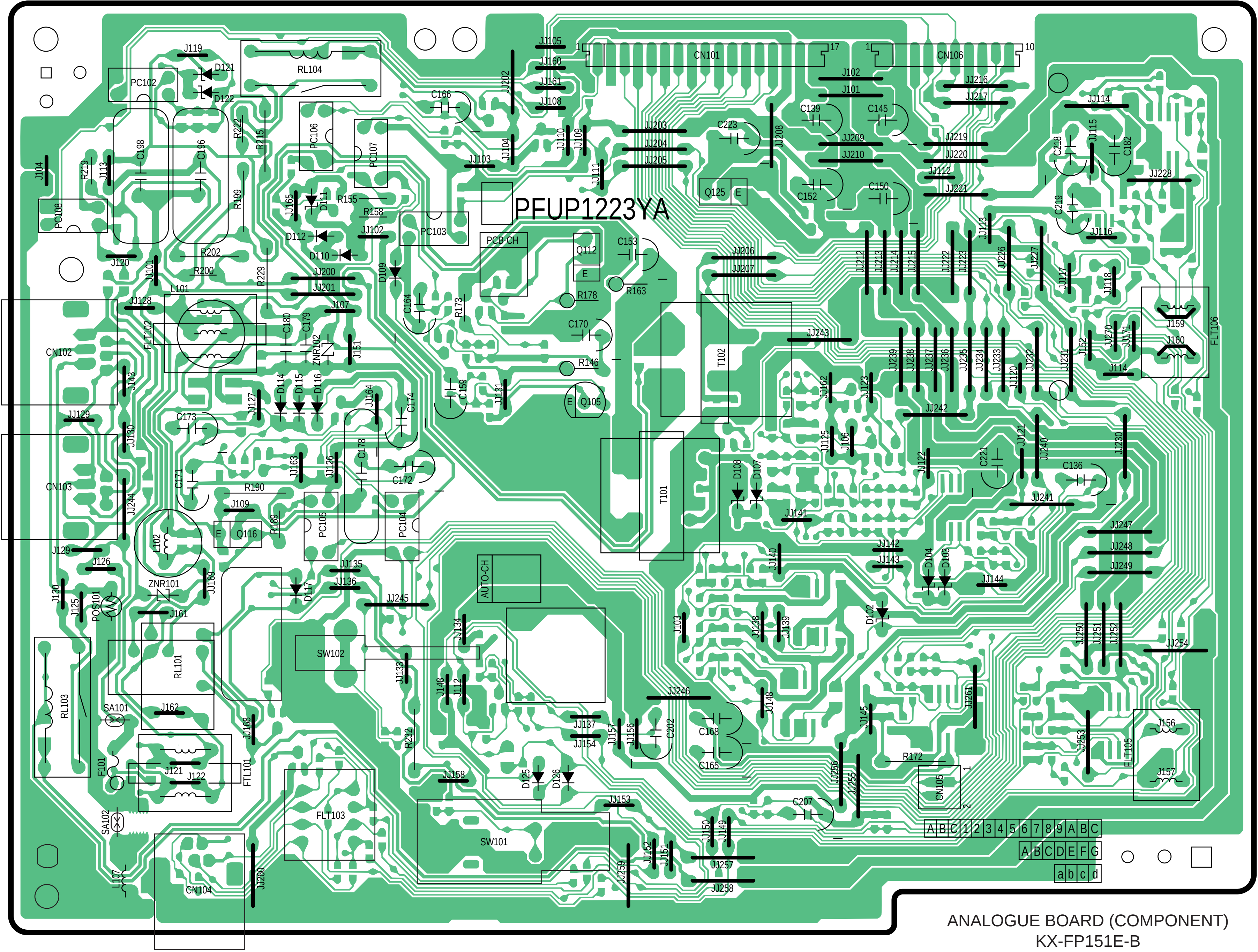
14.1. DIGITAL BOARD

14.2. ANALOGUE BOARD

14.3. OPERATION BOARD

14.4. POWER SUPPLY BOARD

TN / KXFP151EB / KXFP151GRW / KXFP151SPW



PFUP1223YA
CN101
1
17
CN106
1
10
RL104
J119
D121
D122
PC102
PC106
PC107
PC108
PC103
PCB-CH
Q112
E
Q125
E
C166
C198
C196
R222
R215
R219
J113
J104
R199
JJ102
JJ103
JJ104
JJ105
JJ160
JJ161
JJ108
JJ110
JJ109
JJ111
JJ202
JJ203
JJ204
JJ205
C223
JJ208
J102
J101
C139
C145
JJ209
JJ210
C152
C150
JJ216
JJ217
JJ219
JJ220
JJ112
JJ221
JJ114
JJ115
C218
C182
JJ228
C219
JJ116
JJ165
D111
R155
R158
D112
D110
D109
J120
R202
R200
JJ101
R229
JJ200
JJ201
C153
R178
R163
JJ206
JJ207
J107
L101
JJ128
FLT102
CN102
C180
C179
ZNR102
J151
C164
R173
C170
R146
T102
JJ243
JJ212
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JJ214
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J160
FLT106
J152
JJ270
JJ171
J114
JJ239
JJ238
JJ237
JJ236
JJ235
JJ234
JJ233
JJ120
JJ232
JJ231
J143
D114
D115
D116
JJ127
JJ164
C174
C159
JJ131
Q105
E
JJ162
JJ123
JJ242
JJ129
JJ130
C173
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JJ126
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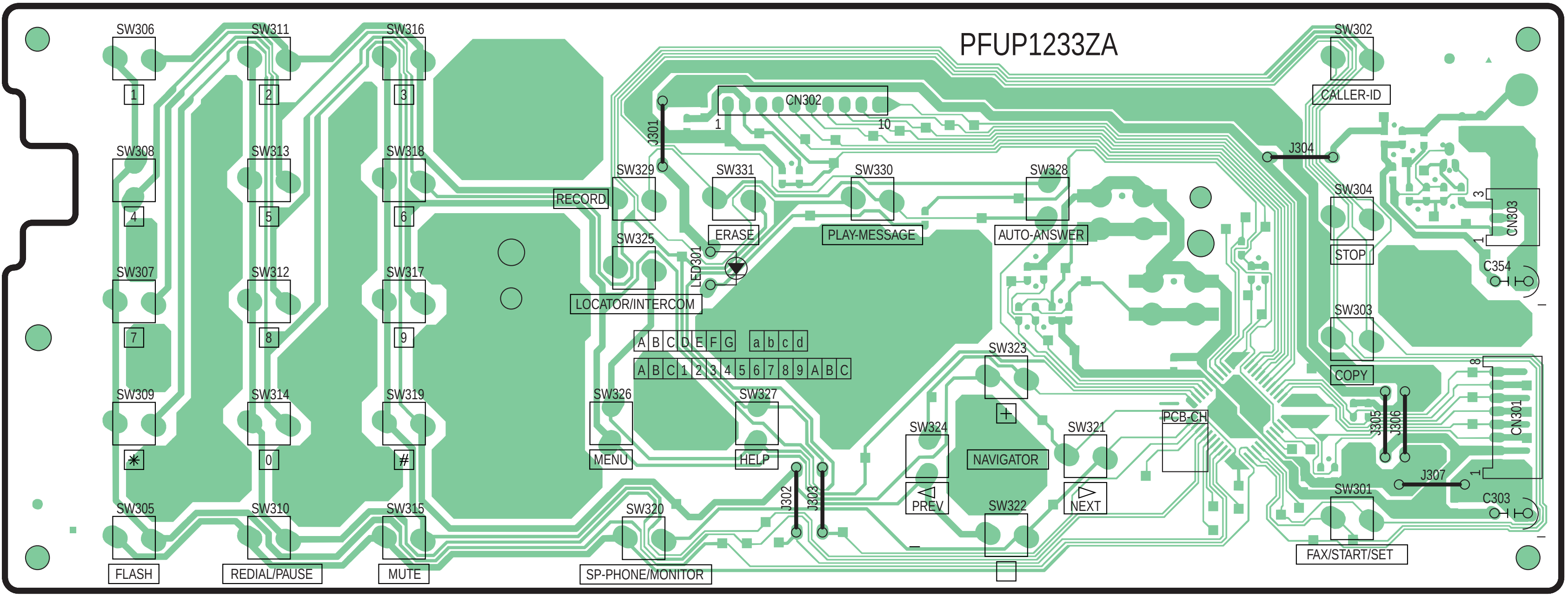
C172
R190
J109
E
Q116
R189
PC105
PC104
T101
D108
D107
JJ125
J106
JJ122
C221
JJ121
JJ240
C136
JJ230
JJ241
JJ141
CN103
JJ244
L102
J129
J126
JJ135
JJ136
D117
JJ169
ZNR101
J130
J125
POS101
J161
JJ245
AUTO-CH
JJ142
JJ143
JJ140
D104
D103
JJ144
JJ247
JJ248
JJ249
D102
J103
JJ138
JJ139
JJ250
JJ251
JJ252
JJ254
RL101
RL103
SW102
JJ134
JJ133
J148
J112
J162
SA101
JJ168
R232
JJ246
JJ148
JJ261
JJ145
JJ137
JJ154
JJ157
JJ156
C202
C168
C165
R172
J156
FLT105
J157
JJ253
J121
J122
F101
FTL101
JJ158
D125
D126
JJ256
JJ255
CN105
1
2
FLT103
JJ153
C207
SA102
SW101
JJ150
JJ149
A B C 1 2 3 4 5 6 7 8 9 A B C
A B C D E F G
a b c d
L107
CN104
JJ260
JJ259
JJ152
JJ151
JJ257
JJ258

ANALOGUE BOARD (COMPONENT)
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

(COMPONENT VIEW)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SW306
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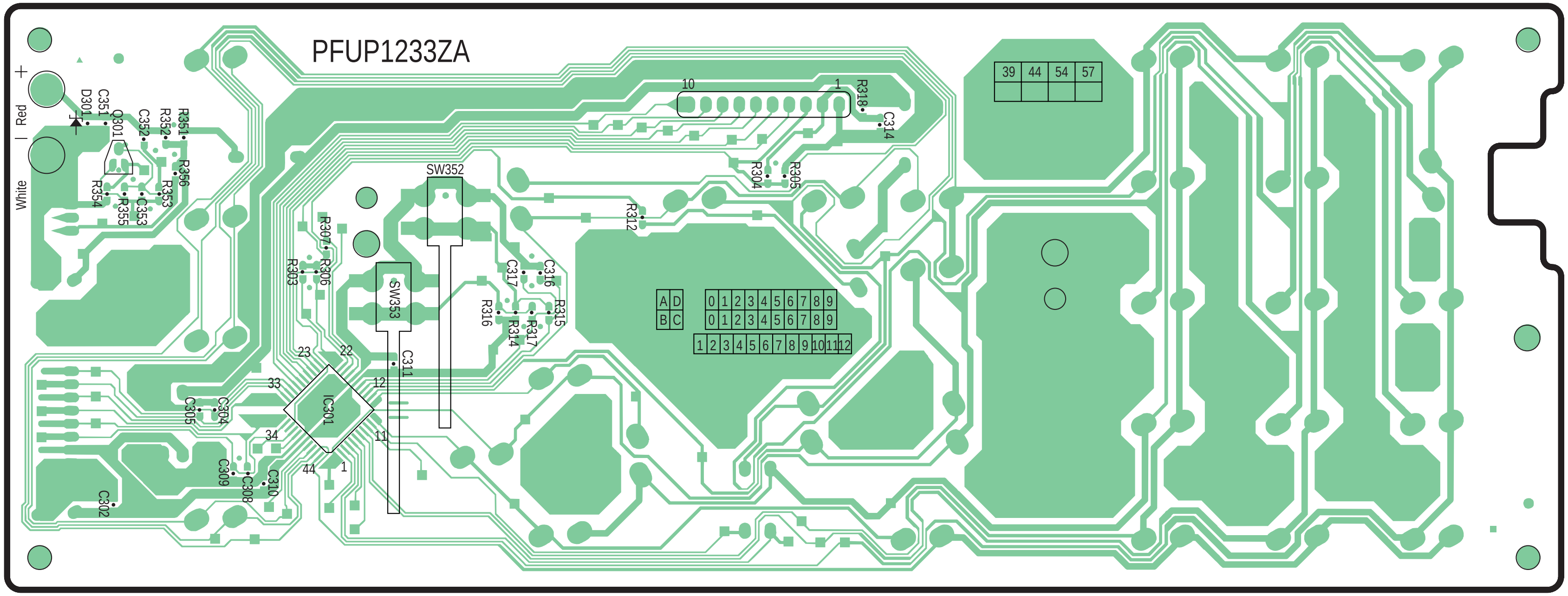
SW311
2
SW316
3
SW308
4
SW313
5
SW318
6
SW307
7
SW312
8
SW317
9
SW309
*
SW314
0
SW319
#
SW305
FLASH
SW310
REDIAL/PAUSE
SW315
MUTE
CN302
1
10
J301
SW329
RECORD
SW331
ERASE
SW330
PLAY-MESSAGE
SW328
AUTO-ANSWER
SW325
LOCATOR/INTERCOM
LED301
A B C D E F G
a b c d
A B C 1 2 3 4 5 6 7 8 9 A B C
SW326
MENU
SW327
HELP
J302
J303
SW320
SP-PHONE/MONITOR
SW323
SW324
PREV
NAVIGATOR
SW321
NEXT
SW322
PCB-CH
SW302
CALLER-ID
J304
SW304
STOP
CN303
3
1
C354
SW303
COPY
J305
J306
CN301
8
1
J307
SW301
C303
FAX/START/SET

(BOTTOM VIEW)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+
Red
−
White
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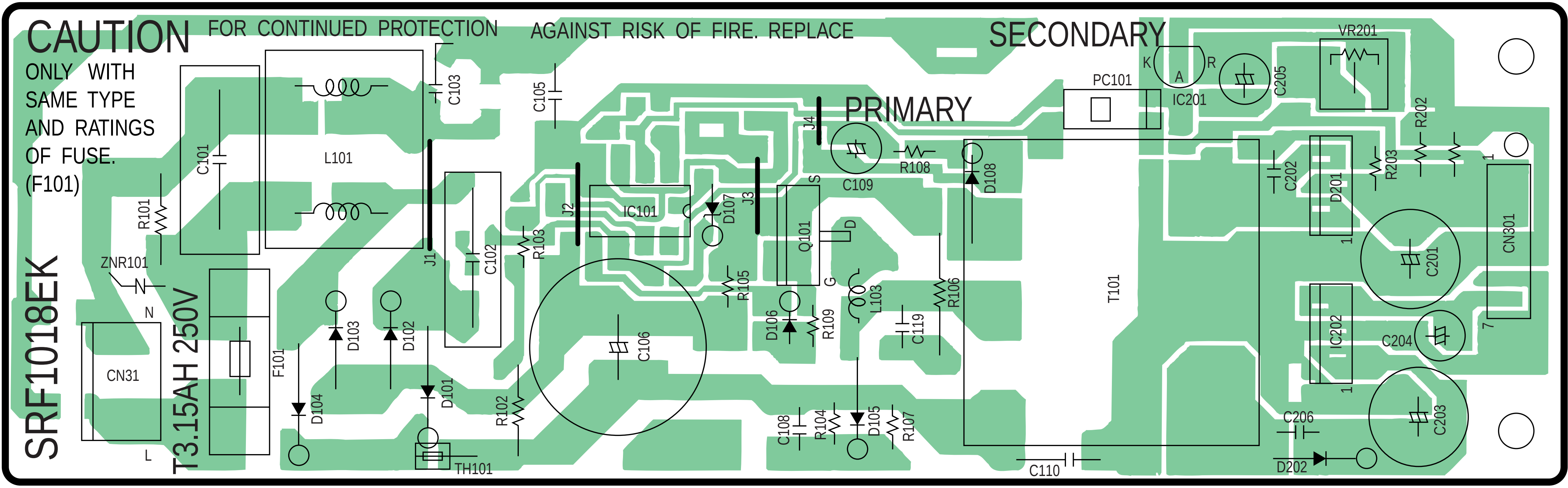
D301
Q301
C352
R352
R351
R356
R354
R355
C353
R353
10
1
R318
C314
R304
R305
SW352
R312
R307
R306
R303
C317
C316
R316
R314
R317
R315
SW353
C311
23
22
33
12
IC301
34
11
44
1
C305
C304
C309
C308
C310
C302
A D
B C
0 1 2 3 4 5 6 7 8 9
0 1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9 10 11 12
39 44 54 57

OPERATION PANEL BOARD
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

(COMPONENT VIEW)


CAUTION FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE ONLY WITH SAME TYPE AND RATINGS OF FUSE. (F101)
SECONDARY
PRIMARY
SRF1018EK
T3.15AH 250V
R101
ZNR101
N
CN31
L
C101
L101
C103
C105
J1
C102
D103
D102
D104
D101
F101
R103
R102
TH101
C106
J2
IC101
D107
J3
J4
C109
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T101
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K
A
R
IC201
C205
VR201
C202
D201
R203
R202
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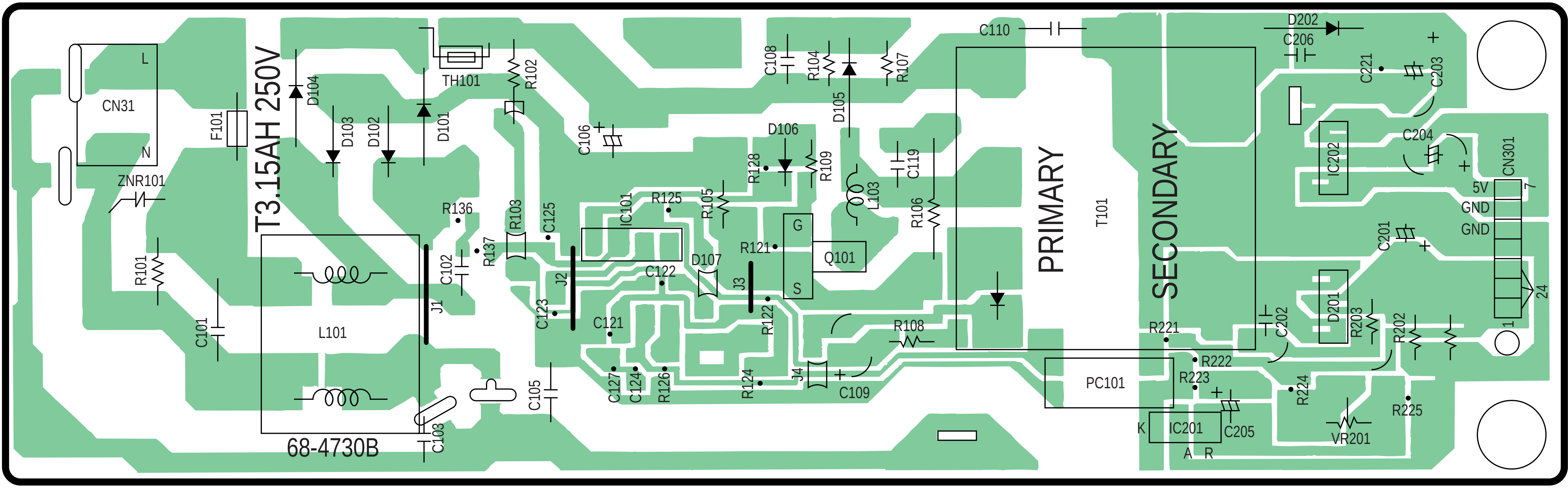
CN301
7
C201
IC202
C204
C206
C203
D202

(BOTTOM VIEW)


L
CN31
N
ZNR101
R101
C101
F101
T3.15AH 250V
D104
D103
D102
D101
L101
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TH101
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R136
R103
R137
C102
J1
C105
C103
C106
C125
C123
J2
IC101
R125
C122
C121
C127
C124
R126
R105
D107
J3
R122
R124
J4
C109
R121
G
Q101
S
C108
R104
D105
R107
D106
R128
R109
L103
C119
R106
R108
C110
PRIMARY
T101
SECONDARY
PC101
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R222
R223
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R
C205
R224
VR201
R225
D202
C206
C221
C203
IC202
C204
CN301
5V
GND
GND
7
C201
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C202
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R202
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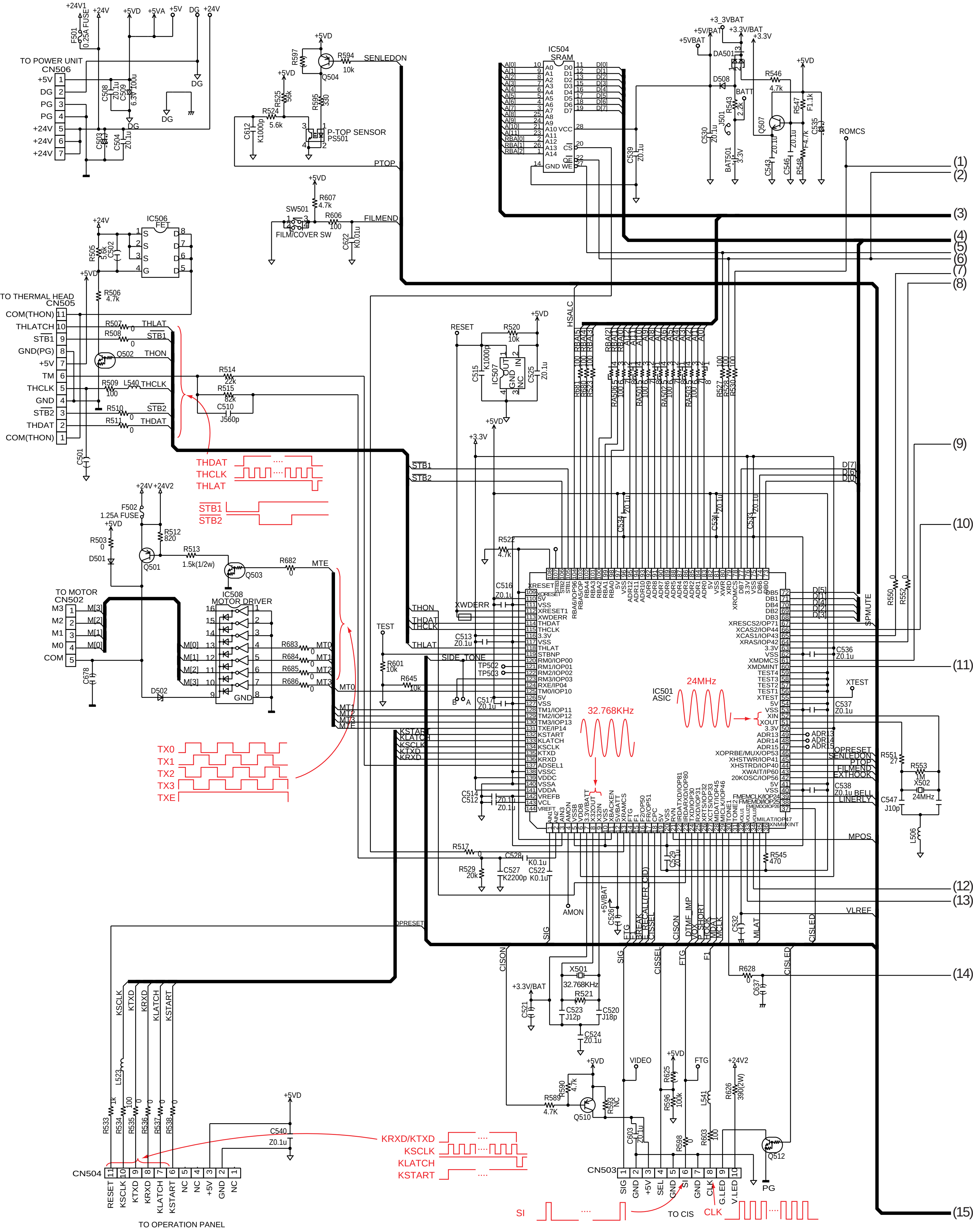
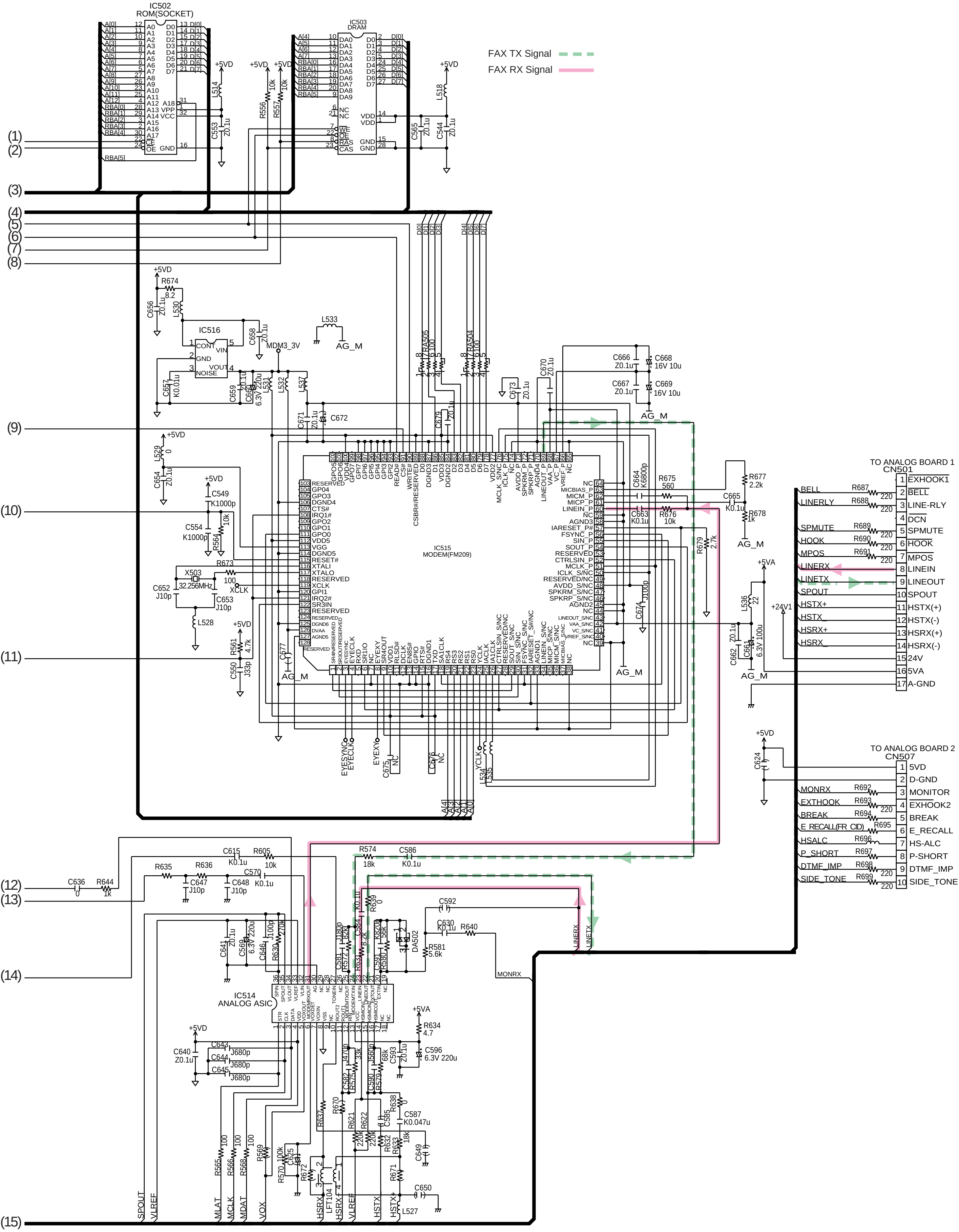
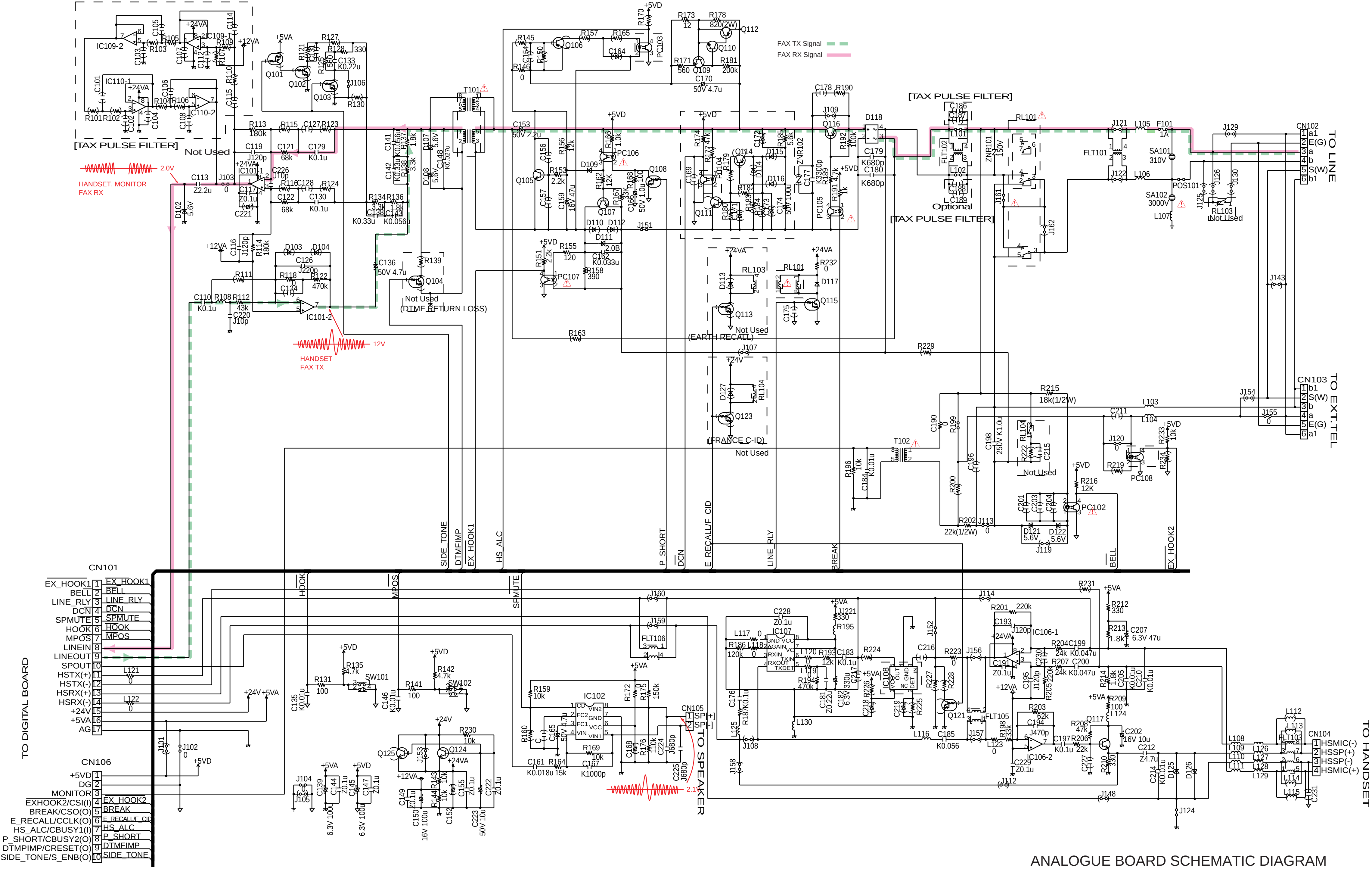
POWER SUPPLY BOARD
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W


TO POWER UNIT
CN506
TO THERMAL HEAD
CN505
TO MOTOR
CN502
IC506
FET
IC508
MOTOR DRIVER
IC504
SRAM
IC501
ASIC
IC507
P-TOP SENSOR
PS501
SW501
FILM/COVER SW
F501
0.25A FUSE
F502
1.25A FUSE
X501
32.768KHz
X502
24MHz
32.768KHz
24MHz
THDAT
THCLK
THLAT
STB1
STB2
TX0
TX1
TX2
TX3
TXE
KRXD/KTXD
KSCLK
KLATCH
KSTART
SI
CLK
TO CIS
CN503
CN504
TO OPERATION PANEL
SENLEDON
PTOP
FILMEND
ROMCS
RESET
XWDERR
TEST
XTEST
SPMUTE
MPOS
VLREF
AMON
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)

DIGITAL BOARD SCHEMATIC DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W


FAX TX Signal
FAX RX Signal
IC502
ROM(SOCKET)
IC503
DRAM
IC516
IC515
MODEM(FM209)
IC514
ANALOG ASIC
X503
32.256MHz
MDM3_3V
AG_M
+5VD
+5VA
+24V1
TO ANALOG BOARD 1
CN501
1 EXHOOK1
2 BELL
3 LINE-RLY
4 DCN
5 SPMUTE
6 HOOK
7 MPOS
8 LINEIN
9 LINEOUT
10 SPOUT
11 HSTX(+)
12 HSTX(-)
13 HSRX(+)
14 HSRX(-)
15 24V
16 5VA
17 A-GND
TO ANALOG BOARD 2
CN507
1 5VD
2 D-GND
3 MONITOR
4 EXHOOK2
5 BREAK
6 E_RECALL
7 HS-ALC
8 P-SHORT
9 DTMF_IMP
10 SIDE_TONE
BELL
LINERLY
SPMUTE
HOOK
MPOS
LINERX
LINETX
SPOUT
HSTX+
HSTX_
HSRX+
HSRX_
MONRX
EXTHOOK
BREAK
E_RECALL(FR CID)
HSALC
P_SHORT
DTMF_IMP
SIDE_TONE
EYESYNC
EYECLK
EYEXY
YCLK
XCLK
LFT104
L527
SPOUT
VLREF
MLAT
MCLK
MDAT
VOX
HSRX
HSRX
VLREF
HSTX
HSTX
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)

DIGITAL BOARD SCHEMATIC DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

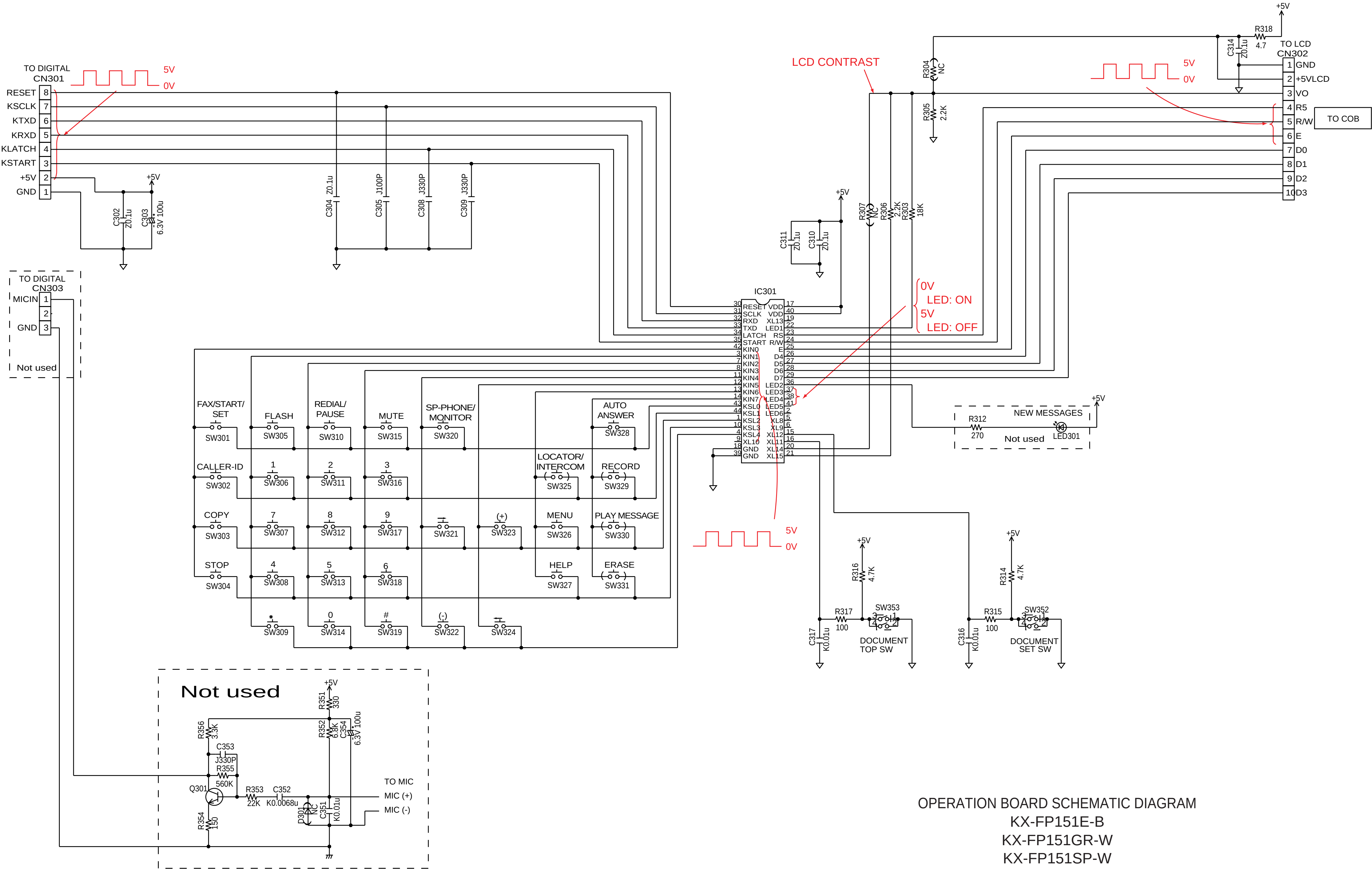

FAX TX Signal
FAX RX Signal
[TAX PULSE FILTER]
Not Used
HANDSET, MONITOR
FAX RX
2.0V
HANDSET
FAX TX
12V
Not Used
(DTMF RETURN LOSS)
(EARTH RECALL)
(FRANCE C-ID)
Optional
TO LINE
CN102
1 a1
2 E(G)
3 a
4 b
5 S(W)
6 b1
TO EXT.TEL
CN103
1 b1
2 S(W)
3 b
4 a
5 E(G)
6 a1
CN101
EX_HOOK1
BELL
LINE_RLY
DCN
SPMUTE
HOOK
MPOS
LINEIN
LINEOUT
SPOUT
HSTX(+)
HSTX(-)
HSRX(+)
HSRX(-)
+24V
+5VA
AG
TO DIGITAL BOARD
CN106
+5VD
DG
MONITOR
EXHOOK2/CSI(I)
BREAK/CSO(O)
E_RECALL/CCLK(O)
HS_ALC/CBUSY1(I)
P_SHORT/CBUSY2(O)
DTMPIMP/CRESET(O)
SIDE_TONE/S_ENB(O)
EX_HOOK2
BREAK
E_RECALL/F_CID
HS_ALC
P_SHORT
DTMFIMP
SIDE_TONE
CN105
SP[+]
SP[-]
TO SPEAKER
2.1V
CN104
HSMIC(-)
HSSP(+)
HSSP(-)
HSMIC(+)
TO HANDSET
IC101-1
IC101-2
IC102
IC107
IC108
IC106-1
IC106-2
IC109-1
IC109-2
IC110-1
IC110-2
T101
T102
RL101
RL103
RL104
PC102
PC105
PC106
PC107
PC108
ZNR101
ZNR102
SA101
SA102
FLT101
FLT102
FLT103
FLT105
FLT106
SW101
SW102

ANALOGUE BOARD SCHEMATIC DIAGRAM

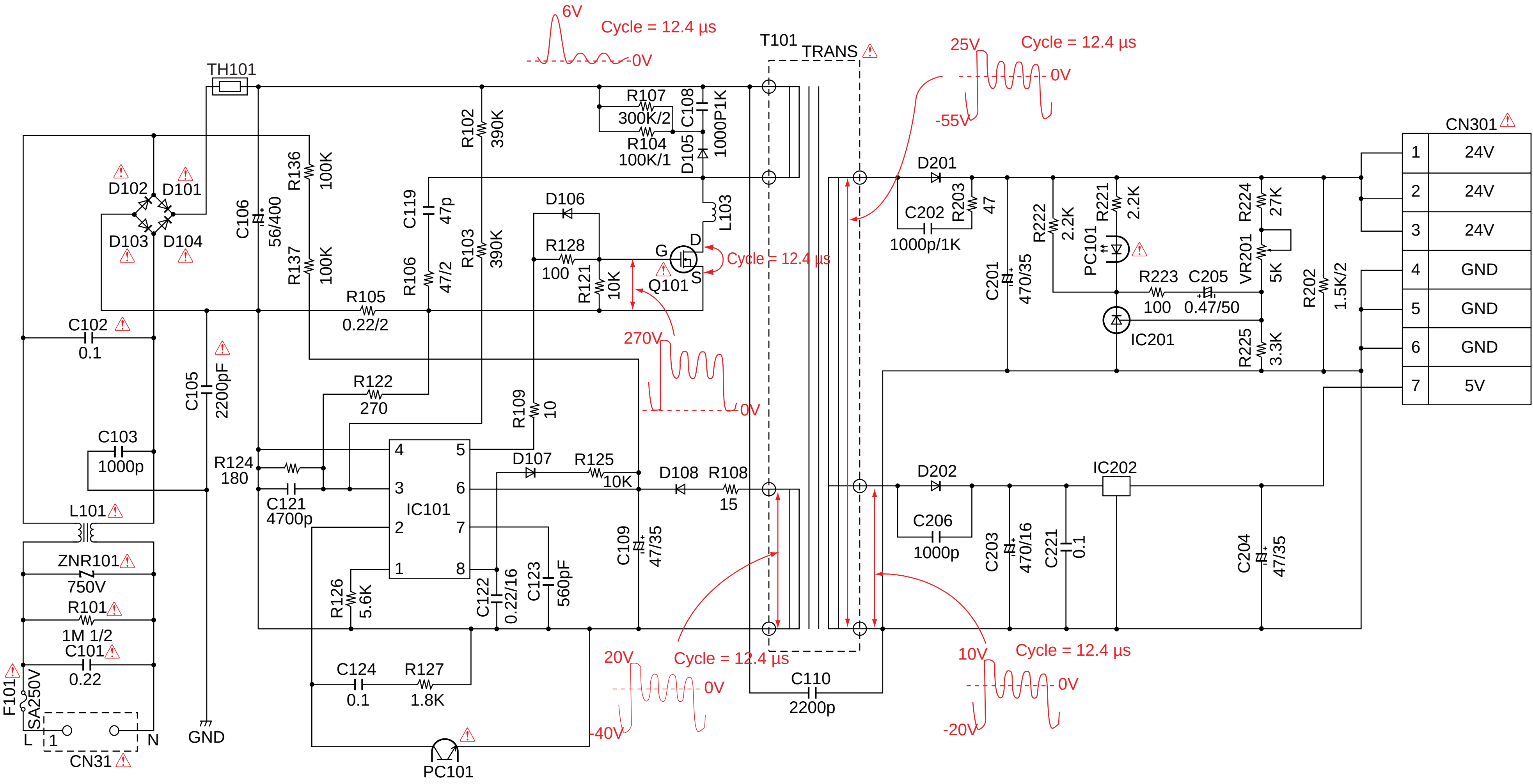
KX-FP151E-B

KX-FP151GR-W

KX-FP151SP-W

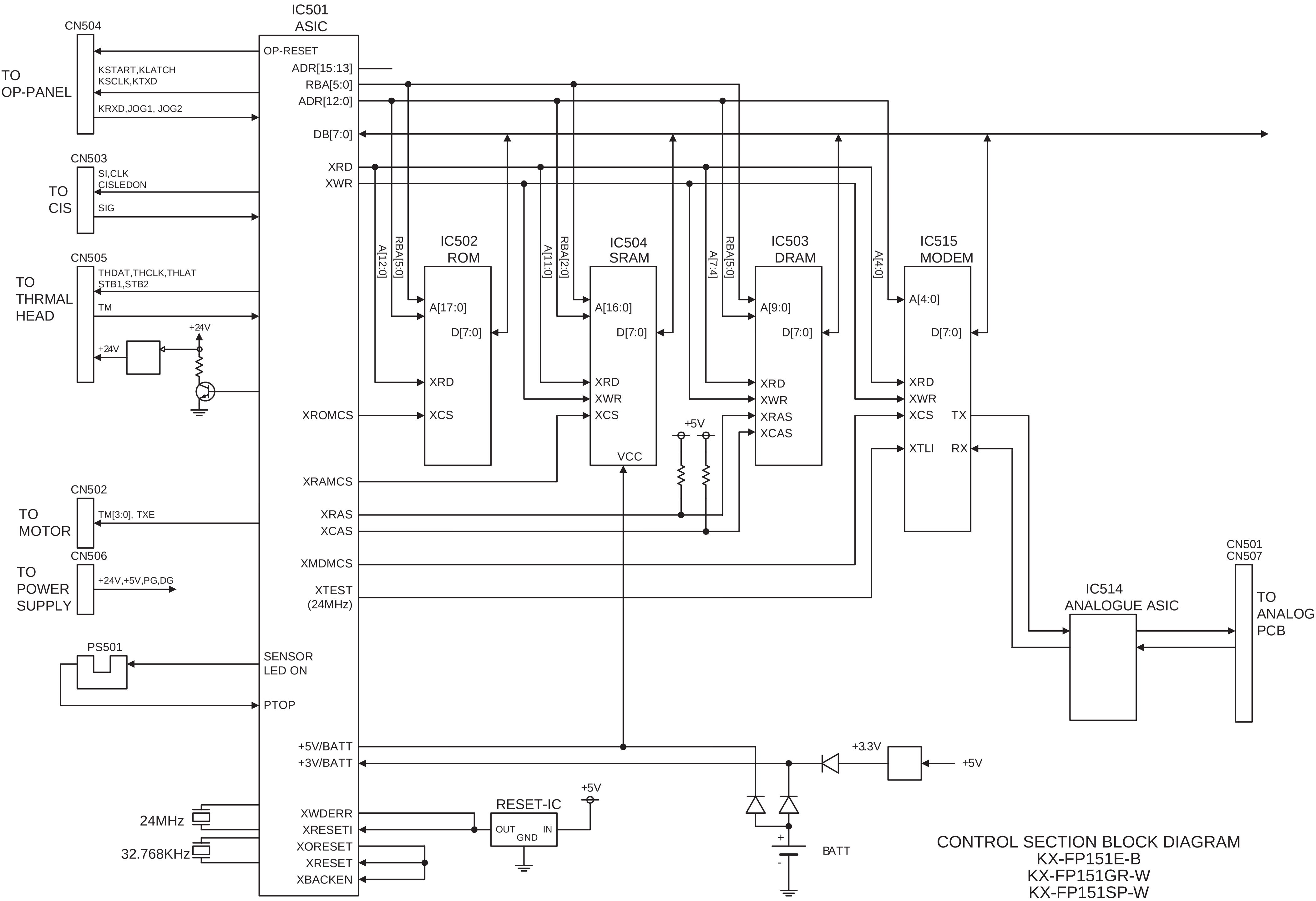

TO DIGITAL
CN301
RESET 8
KSCLK 7
KTXD 6
KRXD 5
KLATCH 4
KSTART 3
+5V 2
GND 1
5V
0V
+5V
C302 Z0.1u
C303 6.3V 100u
C304 Z0.1u
C305 J100P
C308 J330P
C309 J330P
TO DIGITAL
CN303
MICIN 1
2
GND 3
Not used
LCD CONTRAST
R304 NC
R305 2.2K
R318 4.7
C314 Z0.1u
+5V
TO LCD
CN302
1 GND
2 +5VLCD
3 VO
4 R5
5 R/W
6 E
7 D0
8 D1
9 D2
10 D3
TO COB
5V
0V
+5V
C311 Z0.1u
C310 Z0.1u
R307 NC
R306 2.2K
R303 18K
IC301
30 RESET
31 SCLK
32 RXD
33 TXD
34 LATCH
35 START
42 KIN0
3 KIN1
7 KIN2
8 KIN3
11 KIN4
12 KIN5
13 KIN6
14 KIN7
43 KSL0
44 KSL1
1 KSL2
10 KSL3
4 KSL4
9 XL10
18 GND
39 GND
VDD 17
VDD 40
XL13 19
LED1 22
RS 23
R/W 24
E 25
D4 26
D5 27
D6 28
D7 29
LED2 36
LED3 37
LED4 38
LED5 41
LED6 2
XL8 5
XL9 6
XL12 15
XL11 16
XL14 20
XL15 21
0V LED: ON
5V LED: OFF
5V
0V
+5V
R312 270
NEW MESSAGES
LED301
Not used
FAX/START/SET SW301
FLASH SW305
REDIAL/PAUSE SW310
MUTE SW315
SP-PHONE/MONITOR SW320
AUTO ANSWER SW328
CALLER-ID SW302
1 SW306
2 SW311
3 SW316
LOCATOR/INTERCOM SW325
RECORD SW329
COPY SW303
7 SW307
8 SW312
9 SW317
SW321
(+) SW323
MENU SW326
PLAY MESSAGE SW330
STOP SW304
4 SW308
5 SW313
6 SW318
HELP SW327
ERASE SW331
* SW309
0 SW314
# SW319
(-) SW322
SW324
+5V
R316 4.7K
R317 100
C317 K0.01u
SW353
DOCUMENT TOP SW
+5V
R314 4.7K
R315 100
C316 K0.01u
SW352
DOCUMENT SET SW
Not used
+5V
R351 330
R356 3.3K
R352 6.8K
C354 6.3V 100u
C353 J330P
R355 560K
Q301
R353 22K
C352 K0.0068u
D301 NC
C351 K0.01u
R354 150
TO MIC
MIC (+)
MIC (-)

OPERATION BOARD SCHEMATIC DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

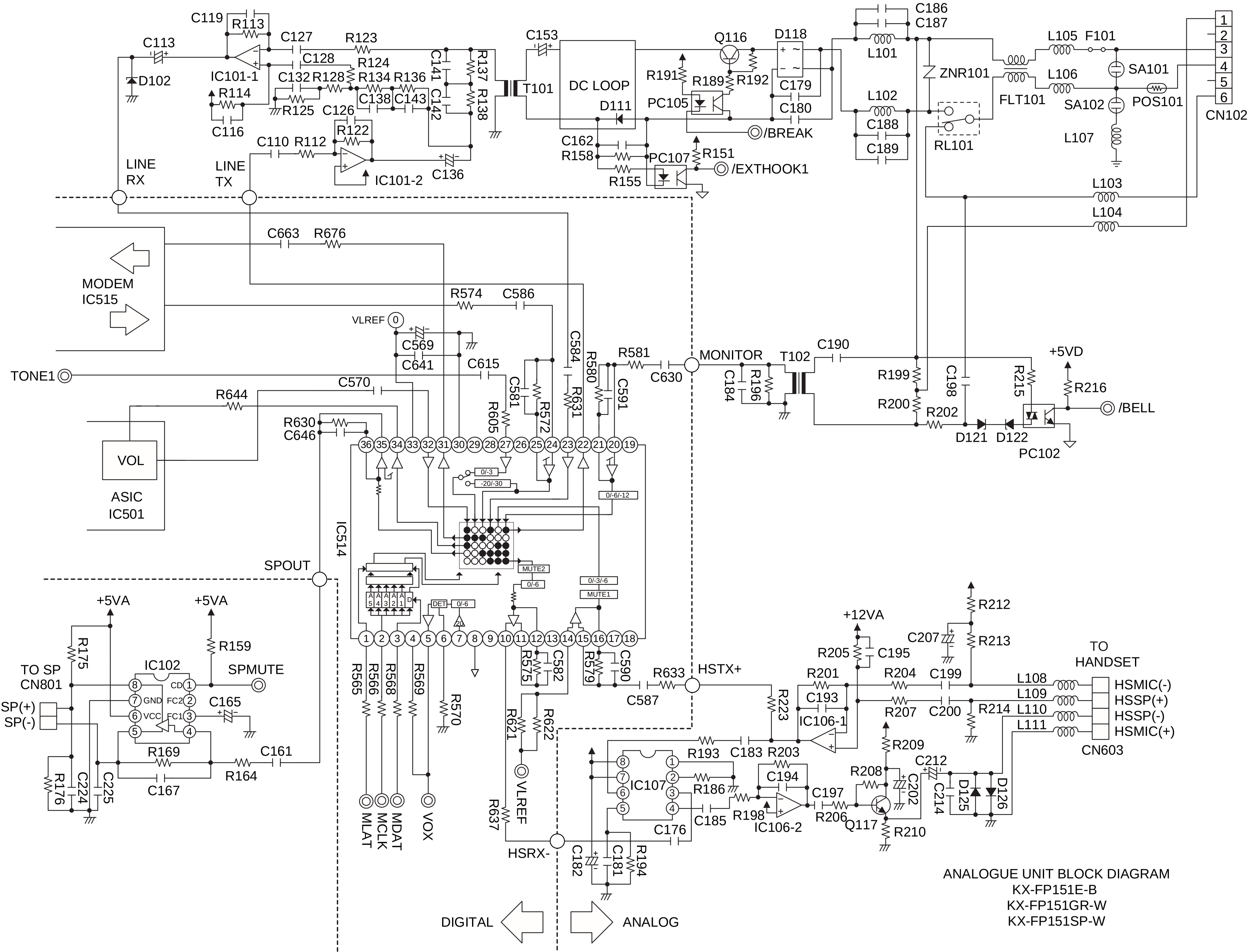


6V
Cycle = 12.4 µs
0V
T101
TRANS
25V
Cycle = 12.4 µs
0V
-55V
CN301
TH101
R107
300K/2
R104
100K/1
C108
1000P1K
D105
R102
390K
D201
C202
1000p/1K
R203
47
1
24V
2
24V
3
24V
4
GND
5
GND
6
GND
7
5V
D102
D101
D103
D104
C106
56/400
R136
100K
R137
100K
C119
47p
R106
47/2
R103
390K
D106
R128
100
R121
10K
L103
D
G
S
Q101
Cycle = 12.4 µs
R222
2.2K
R221
2.2K
PC101
R224
27K
VR201
5K
R223
100
C205
0.47/50
C201
470/35
R202
1.5K/2
IC201
R225
3.3K
C102
0.1
R105
0.22/2
270V
0V
C105
2200pF
R122
270
R109
10
C103
1000p
R124
180
C121
4700p
4
5
3
6
IC101
2
7
1
8
D107
R125
10K
D108
R108
15
C109
47/35
D202
IC202
C206
1000p
C203
470/16
C221
0.1
C204
47/35
L101
ZNR101
750V
R101
1M 1/2
C101
0.22
R126
5.6K
C122
0.22/16
C123
560pF
F101
SA250V
L
1
N
CN31
GND
C124
0.1
R127
1.8K
PC101
20V
Cycle = 12.4 µs
0V
-40V
C110
2200p
10V
Cycle = 12.4 µs
0V
-20V

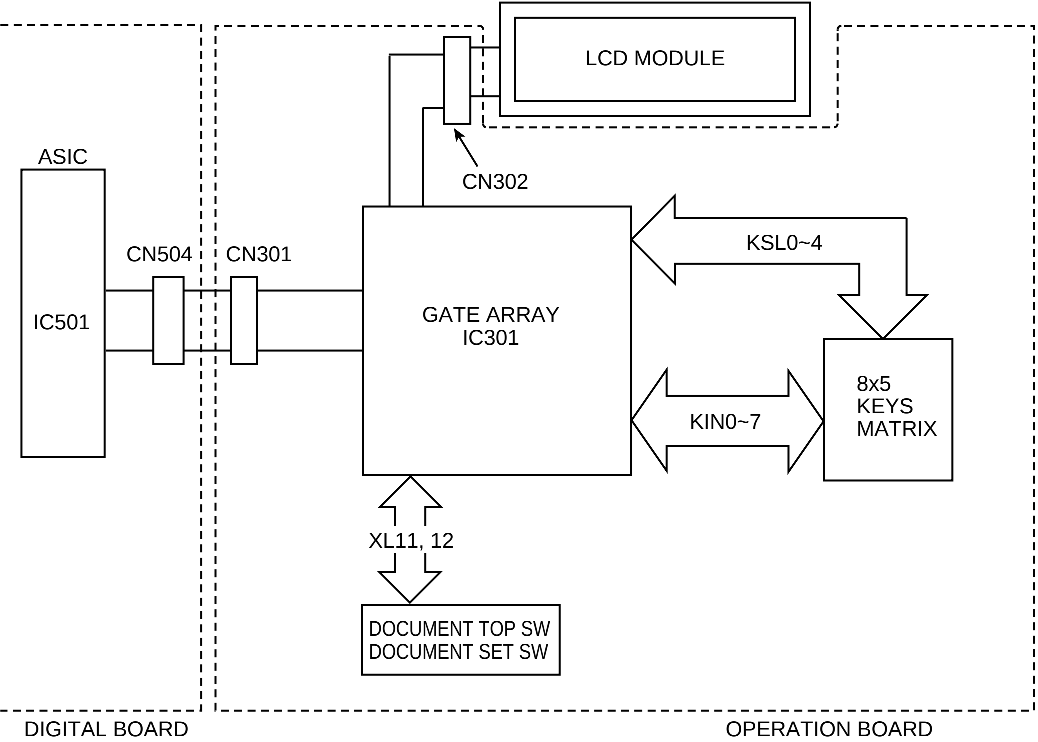
POWER SUPPLY BOARD SCHEMATIC DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

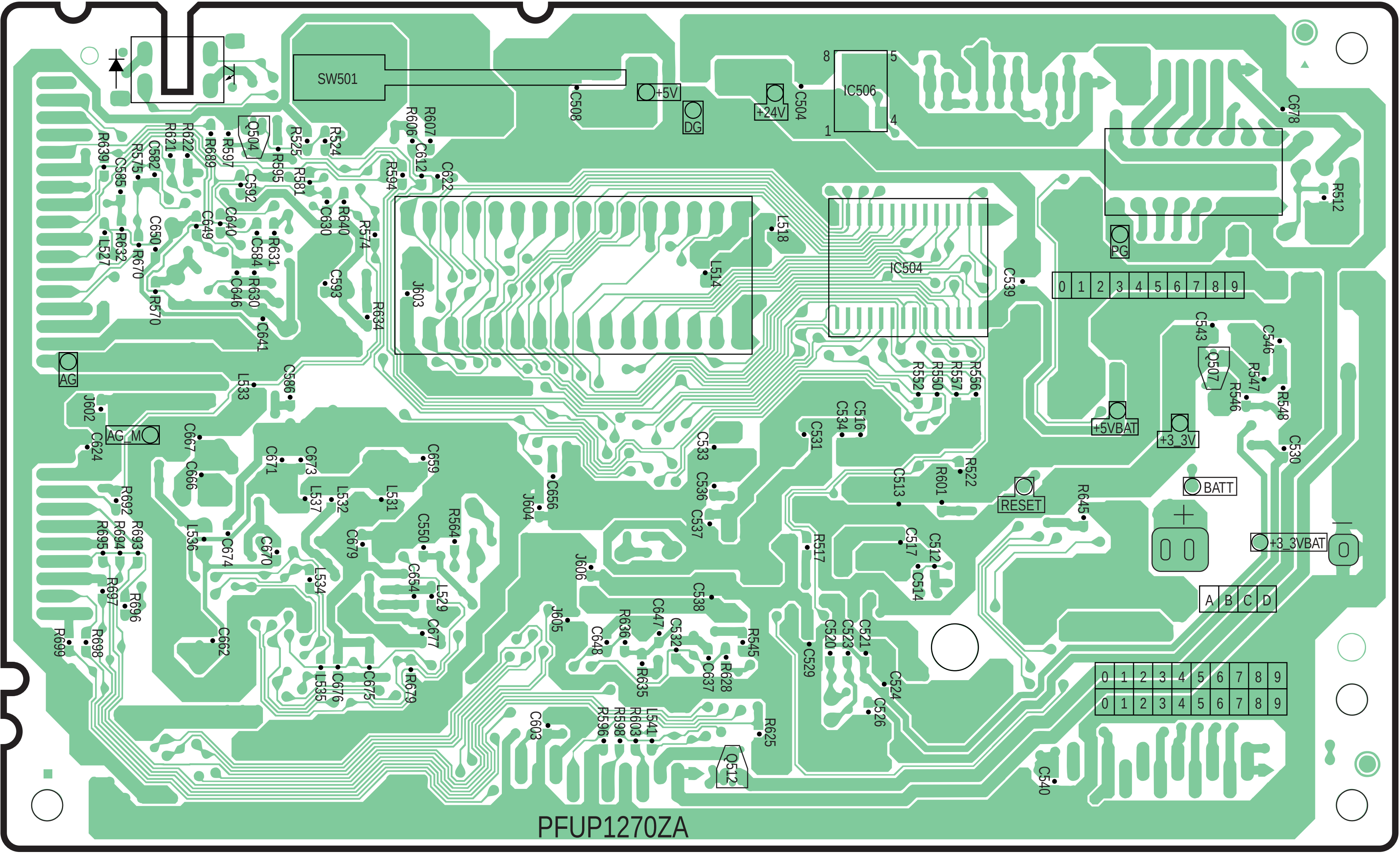

IC501
ASIC
OP-RESET
ADR[15:13]
RBA[5:0]
ADR[12:0]
DB[7:0]
XRD
XWR
XROMCS
XRAMCS
XRAS
XCAS
XMDMCS
XTEST
(24MHz)
SENSOR
LED ON
PTOP
+5V/BATT
+3V/BATT
XWDERR
XRESETI
XORESET
XRESET
XBACKEN
CN504
TO
OP-PANEL
KSTART,KLATCH
KSCLK,KTXD
KRXD,JOG1, JOG2
CN503
TO
CIS
SI,CLK
CISLEDON
SIG
CN505
TO
THRMAL
HEAD
THDAT,THCLK,THLAT
STB1,STB2
TM
+24V
+24V
CN502
TO
MOTOR
TM[3:0], TXE
CN506
TO
POWER
SUPPLY
+24V,+5V,PG,DG
PS501
24MHz
32.768KHz
IC502
ROM
A[12:0]
RBA[5:0]
A[17:0]
D[7:0]
XRD
XCS
IC504
SRAM
A[11:0]
RBA[2:0]
A[16:0]
D[7:0]
XRD
XWR
XCS
VCC
IC503
DRAM
A[7:4]
RBA[5:0]
A[9:0]
D[7:0]
XRD
XWR
XRAS
XCAS
+5V
IC515
MODEM
A[4:0]
A[4:0]
D[7:0]
XRD
XWR
XCS
XTLI
TX
RX
IC514
ANALOGUE ASIC
CN501
CN507
TO
ANALOG
PCB
+3.3V
+5V
RESET-IC
OUT
GND
IN
+5V
+
-
BATT

CONTROL SECTION BLOCK DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

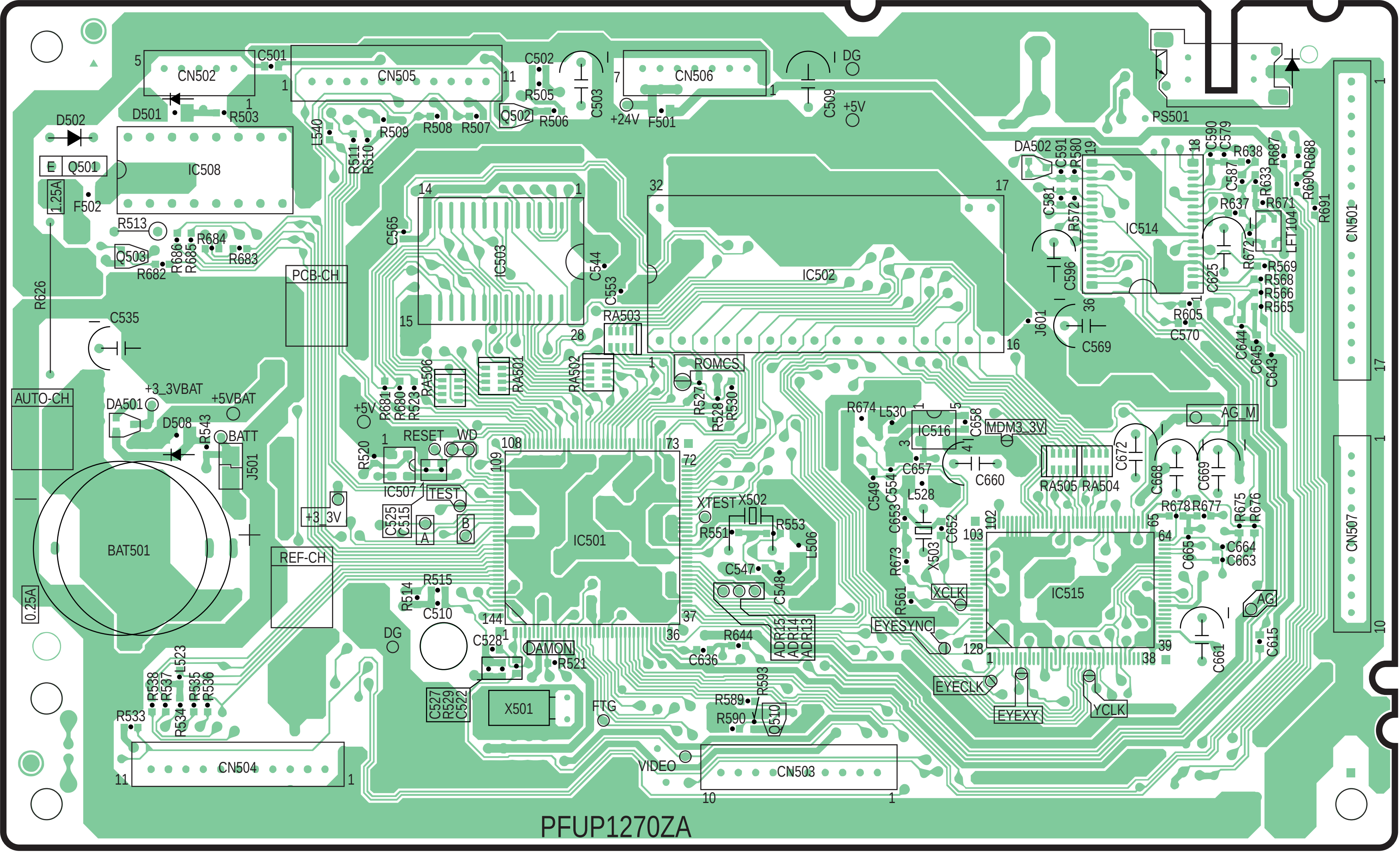

CN102
1
2
3
4
5
6
L105
F101
SA101
L106
SA102
POS101
FLT101
L107
ZNR101
RL101
C186
C187
L101
L102
C188
C189
L103
L104
D118
Q116
R191
R189
R192
C179
C180
PC105
/BREAK
DC LOOP
D111
C153
C162
R158
R155
PC107
R151
/EXTHOOK1
T101
C119
R113
C113
D102
IC101-1
C127
R123
C128
R124
C132
R128
R134
R136
C141
R137
R138
C142
C138
C143
R114
R125
C116
C126
R122
C110
R112
IC101-2
C136
LINE RX
LINE TX
C663
R676
MODEM IC515
R574
C586
VLREF
C569
C641
C615
C584
R580
R581
C630
MONITOR
T102
C190
C184
R196
R199
R200
R202
C198
R215
+5VD
R216
/BELL
D121
D122
PC102
TONE1
C570
C581
R572
R631
C591
R644
R605
R630
C646
VOL
ASIC IC501
IC514
0/-3
-20/-30
0/-6/-12
MUTE2
0/-6
0/-3/-6
MUTE1
DET
0/-6
20
A5 A4 A3 A2 A1 D
36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
SPOUT
R565
R566
R568
R569
R570
R575
C582
R579
C590
R621
R622
VLREF
R637
MLAT
MCLK
MDAT
VOX
HSTX+
R633
C587
HSRX-
+5VA
+5VA
R175
R159
TO SP CN801
SP(+)
SP(-)
IC102
CD
FC2
FC1
GND
VCC
SPMUTE
C165
R169
C167
R164
C161
R176
C224
C225
+12VA
R205
C195
R201
C193
IC106-1
R204
C199
R207
C200
R223
R212
C207
R213
R214
L108
L109
L110
L111
TO HANDSET
HSMIC(-)
HSSP(+)
HSSP(-)
HSMIC(+)
CN603
R193
C183
R203
C194
IC107
R186
C185
R198
IC106-2
C197
R206
Q117
R208
R209
R210
C202
C212
C214
D125
D126
C176
C182
C181
R194
DIGITAL
ANALOG

ANALOGUE UNIT BLOCK DIAGRAM
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W

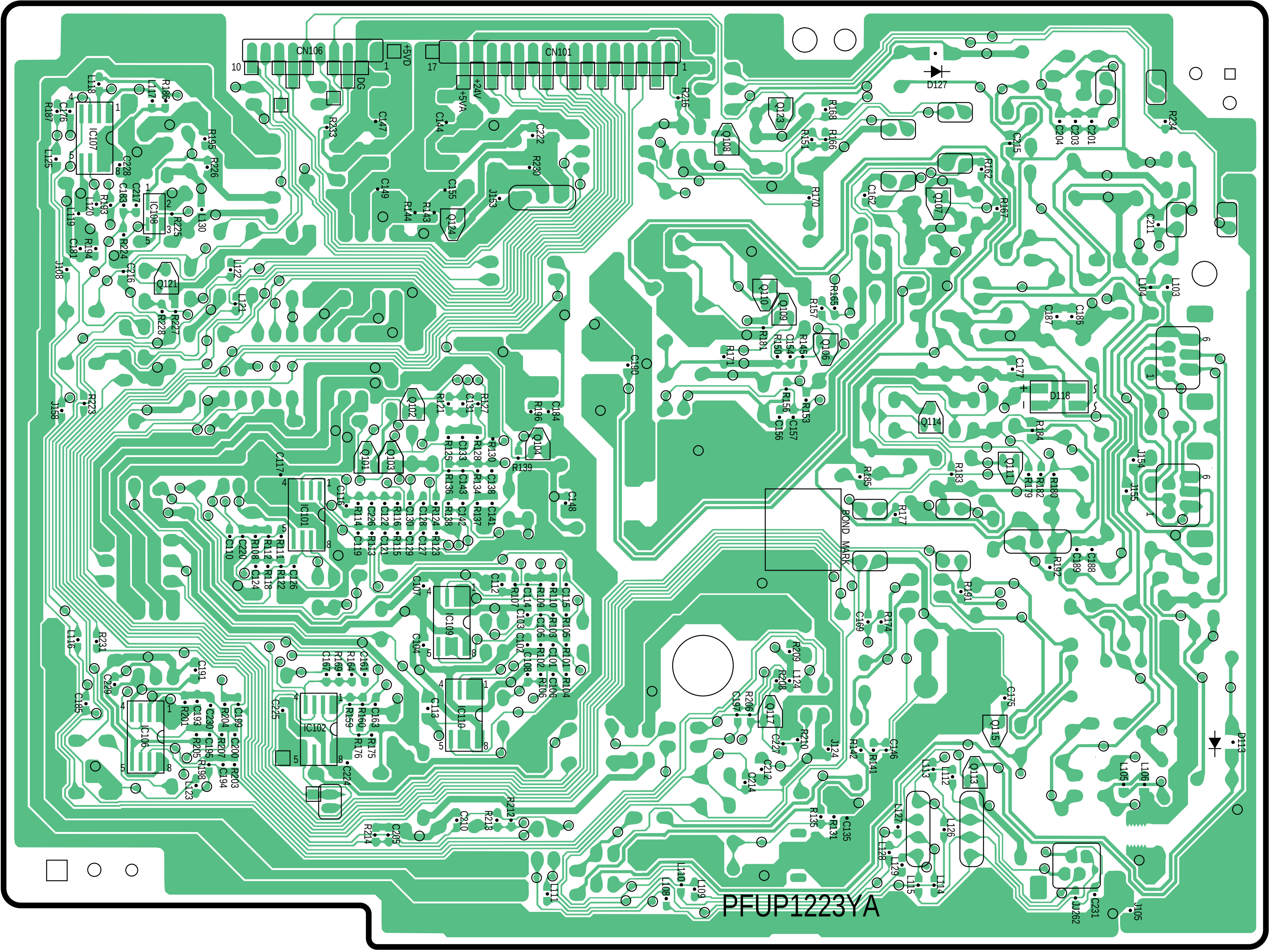

LCD MODULE
CN302
ASIC
IC501
CN504
CN301
GATE ARRAY
IC301
KSL0~4
KIN0~7
8x5
KEYS
MATRIX
XL11, 12
DOCUMENT TOP SW
DOCUMENT SET SW
DIGITAL BOARD
OPERATION BOARD


SW501
+5V
DG
+24V
C504
IC506
8
5
1
4
C678
R512
PG
C508
Q504
R639
R621
R622
R689
R597
R525
R524
R606
R607
C612
C622
R575
C582
C585
R595
R581
R594
C592
C640
C649
C650
R632
L527
R670
C630
R640
R574
L518
C584
R631
C646
R630
C593
J603
L514
IC504
C539
R570
C641
R634
0 1 2 3 4 5 6 7 8 9
C543
C546
Q507
R547
R546
R548
AG
L533
C586
R552
R550
R557
R556
J602
AG_M
C624
C667
C666
C671
C673
C659
C534
C516
C531
+5VBAT
+3_3V
C530
C533
C536
C537
C513
R601
R522
BATT
RESET
R645
R692
R694
R693
R695
L536
C674
C670
L537
L532
L531
C656
J604
C550
R564
C679
R517
C517
C512
C514
+3_3VBAT
J606
L534
C654
L529
C538
A B C D
R697
R696
R699
R698
C662
J605
C648
R636
C647
C532
R545
C529
C520
C523
C521
C677
R635
C637
R628
C524
C526
L535
C676
C675
R679
C603
R596
R598
R603
L541
Q512
R625
C540
PFUP1270ZA

DIGITAL BOARD (BOTTOM)
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W


CN502
C501
CN505
C502
C503
CN506
DG
+5V
R505
R503
D501
D502
R509
R508
R507
Q502
R506
+24V
F501
C509
PS501
IC508
E
Q501
1.25A
F502
L540
R511
R510
DA502
C591
R580
C590
C579
R638
R687
R688
R690
R691
C587
R633
R637
R671
IC514
LFT104
R672
C625
R569
R568
R566
R565
R605
C570
C644
C645
C643
CN501
C581
R572
C596
C569
J601
R513
R684
R686
R685
R683
Q503
R682
R626
PCB-CH
IC503
C565
C544
C553
RA503
IC502
ROMCS
R527
R528
R530
C535
RA506
RA501
RA502
+3_3VBAT
+5VBAT
DA501
D508
R543
BATT
J501
AUTO-CH
+5V
R681
R680
R523
R520
RESET
WD
TEST
IC507
C525
C515
A
B
+3_3V
BAT501
0.25A
REF-CH
R515
R514
C510
DG
C528
DAMON
R521
X501
C527
R529
C522
FTG
IC501
XTEST
X502
R553
R551
L506
C547
C548
ADR15
ADR14
ADR13
R644
C636
R589
R593
R590
Q510
VIDEO
CN503
R674
L530
IC516
C658
MDM3_3V
AG_M
C657
C660
C549
C554
L528
C653
C652
X503
R673
R561
XCLK
EYESYNC
EYECLK
EYEXY
YCLK
RA505
RA504
C672
C668
C669
R678
R677
R675
R676
IC515
C665
C664
C663
AG
C661
C615
CN507
L523
R538
R537
R535
R536
R534
R533
CN504
PFUP1270ZA

DIGITAL BOARD (COMPONENT)
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W


CN106
10
1
DG
+5VD
17
CN101
1
+24V
+5VA
R216
D127
L118
L117
R186
R187
C176
IC107
R195
R226
R233
C147
C144
C222
R230
C228
C183
C217
R193
L120
L119
IC108
R225
L130
C149
R144
R143
C155
Q124
J153
R168
R166
R151
Q123
Q108
R170
C162
Q107
R162
R167
C215
C204
C203
C201
R234
C211
C181
R194
R224
J108
C216
Q121
L122
L121
R228
R227
L104
L103
Q110
Q109
R165
R157
R181
R171
R150
C154
R145
Q106
C187
C186
C190
C177
D118
J158
R223
Q102
R121
C131
R127
R196
C184
Q104
R156
C156
R153
C157
Q114
R184
C117
Q101
Q103
R125
C133
R128
R130
R139
R136
C143
R134
C138
J154
J155
R183
R179
R182
R180
R185
IC101
C116
R114
C226
C122
R116
C130
R124
C128
C142
C141
R137
C148
R177
BOND MARK
C110
C220
R108
R111
R112
R113
C121
R115
C129
C127
R123
C119
R138
C124
R118
R122
C126
C189
C188
R192
R191
C112
C107
IC109
R107
C114
R109
R110
C115
C103
C106
R103
R105
C102
C108
R102
R101
C101
R106
R104
C104
C169
R174
L116
R231
C191
C229
C185
IC106
R201
C193
C230
R204
C199
R205
C195
R207
C200
R198
C194
R203
L123
C225
IC102
R169
R164
C161
C167
R159
R160
C163
R176
R175
C224
IC110
C113
R209
R208
L124
R206
C197
Q117
C227
R210
J124
R142
R141
C146
C175
Q115
D113
L113
L112
Q113
L105
L106
C212
C214
R135
R131
C135
L127
L126
L128
L129
L115
L114
R212
R213
C210
R214
C205
L110
L108
L109
L111
PFUP1223YA
L262
C231
J105

ANALOGUE BOARD (BOTTOM)
KX-FP151E-B
KX-FP151GR-W
KX-FP151SP-W